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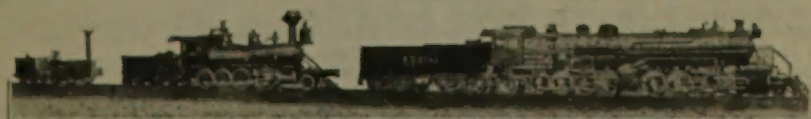
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COMPILED AND EDITED BY

SLASON THOMPSON

DIRECTOR OF BUREAU OF RAILWAY NEWS
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INTRODUCTION

Following the general plan of its predecessors, the sixth annual issue of *The Railway Library* presents in a bound volume the more noteworthy addresses and papers delivered during the year 1914 relating to railway subjects. As in former years, the date of its publication permits the inclusion of several articles of the current year.

In order to form the background for a fuller and fairer appreciation of what the American railways of today are doing for this continent of magnificent distances, the editor deems it fortunate that, by permission of its publishers, he is able to open this volume with an illuminating chapter from Seymour Dunbar's "History of Travel in America," just from the press. This deals with stage coaching in the days just before the railway came with a rush to displace all other means of long distance land transportation. Following this comes the prospectus of an Illinois railroad which solicited subscriptions to stock with tempting promises of 25 per cent returns on the investment. This prospectus bears date within ten years of the stage coach period described by Mr. Dunbar.

Following these echoes of the past is a series of articles on the railway problems and pressing needs of the American railways of the present, by such authorities as President Rea of the Pennsylvania, James J. Hill, President Ripley of the Santa Fe, and other noted leaders in practical railway affairs. These are supplemented with addresses by the Hon. Oscar Underwood, who until his recent elevation to the Senate was the leader of the majority party in the House of Representatives. Like a voice from "the beyond" reads the letter of the late Charles Francis Adams to President Wilson, through him warning the authorities that a rate increase was vital to the railways.

Next follows an instructive series of papers on railway valuation and taxation, succeeded by another series showing up the unjust treatment of the railways by the government in the matter of railway mail pay, parcel post burdens and the cutting down of express returns.

The subject of government ownership, with which we are threatened as the alternative for a failure of government regulation, is treated of in broad lines by Seth Low, W. M. Acworth and ex-

Senator Jonathan Bourne, Jr., while R. H. Tingley furnishes a comprehensive review of the world's experiences with this alluring substitute for the best transportation system in the world.

Naturally *The Railway Library* for 1914 devotes considerable space to the part the railways are playing in the war that is devastating Europe. The railways of Germany are performing the gigantic task for which they have been developed, as in a lesser degree are those of France. The Belgian railways have been absorbed into the German system. The British railways have been practically taken over by the government. The Italian roads are serving the government more efficiently than could have been expected. In Russia alone are the railways utterly inadequate to grapple with the rapid concentration of the Teutonic allies along the Polish border. On the Russian side of that border, however, the absence of rail facilities conforming to the German gauge has the effect of slowing-up the advance of the invaders to the pace of Napoleon's hosts a hundred years ago.

That peace hath its triumphs as well as war is shown in the illustrated article on the new union passenger terminal at Kansas City.

As in former issues, the concluding chapter of *The Railway Library* consists of the annual report of the Bureau of Railway News and Statistics in which is presented the latest information in regard to American and foreign railways, being the most comprehensive annual review of its kind in the United States.

SLASON THOMPSON.

Chicago, July, 1915.

TRANSPORTATION IN AMERICA JUST BEFORE THE ADVENT OF THE RAILROAD

BY SEYMOUR DUNBAR

BEING CHAPTER XXXIV OF HIS "HISTORY OF TRAVEL IN AMERICA"
IN 4 VOLUMES, JUST PUBLISHED BY THE BOBBS-MERRILL COM-
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It is doubtful if any description written today could adequately portray the importance—in its relation to the affairs of the people—which stage-coach traffic assumed during the period between 1800 and 1840. During the years in question it was the only means by which a large part of the population could accomplish overland journeys, and even in those instances wherein rivers and canals were available for some portions of the expeditions to be undertaken, travelers often had to resort to the stage-coach for considerable parts of the distances traversed. There was no general thought of the future possibility of more comfortable and rapid means of overland conveyance, and all those circumstances of progress by stage which now seem to us to be so archaic and remote were then esteemed as the height of travel luxury. It was seldom that complaints were made by the public about the uncomfortable and wearying conditions that inevitably attended stage-coach travel in those times. Whatever happened on a journey was accepted as a matter of course and endured with complaisance and fortitude. The foreign traveller Weld gives an illuminating description of the spirit in which both passengers and stage-coach driver met, with mutual understanding, the difficulties of an expedition. He says: "The driver frequently had to call to the passengers in the stage to lean out of the carriage, first on one side, then on the other, to prevent it from oversetting in the deep ruts with which the road abounds. 'Now, gentlemen, to right!' Upon which the passengers stretched their bodies half way out of the carriage to balance on that side. 'Now, gentlemen, to the left!' " and so on.

The speeds attained by the stage-coaches in those days were esteemed as little short of marvelous. Isaiah Thomas, Jr., had occasion in 1812 to travel from Washington to Baltimore. The trip required one and a half days for its completion in a coach drawn by

three horses. He rode in a regular passenger conveyance. The much swifter mail coaches over the same route then left Washington at four o'clock in the morning, and reached Baltimore, under favorable conditions, about an hour before midnight on the same day. These rates of movement were typical of the speeds maintained throughout the East for many years. One of the best known stage-coach trips of the time was that between Providence and Boston. Travellers from New York to Boston usually left their destination by a steamboat which landed them in Providence in about twenty-three hours, and they then immediately embarked in stage-coaches to traverse the remaining forty miles to the Massachusetts metropolis. No less than fifteen or twenty, and sometimes twenty-five coaches a day plied between the two cities. In a letter written in 1822 in description of the trip, it was said: "We were rattled from Providence to Boston in four hours and fifty minutes. If any one wants to go faster he may send to Kentucky and charter a streak of lightning."

The fare for the Providence-Boston trip was ordinarily three dollars, but the price of a stage-coach ticket, either for that journey or any other, was by no means permanently fixed. Whenever a new stage line was established the older organizations whose field was thus invaded usually reduced their price of passage in the hope that the new company would thereby find its business unprofitable and be compelled to abandon its competition. If the new company met the lowered passenger tariff then the established lines would promptly make another reduction. When all parties to one of these rate-cutting controversies entered upon the struggle with a grim determination to win, the results were sometimes peculiar and also highly satisfactory to the travelling public. One of the most memorable of these fights for traffic was begun by the action of a new Boston-Providence line in reducing its charge to \$2.50. The old lines retaliated by a still further cut to \$2.00. By this time the people of the two cities became enthusiastic in their efforts to encourage the combatants, and so heartily did the warring New England companies enter into the spirit of the fray that the cost of tickets between the communities soon disappeared altogether, and every passenger by any of the competing lines was finally in receipt of a free dinner and a bottle of wine in payment for the privilege of transporting him over the road.

The people of the two towns—or as many of them as could possibly do so—arose to the occasion and for a brief interval the travel between the places assumed astonishing proportions. At this time one of the prominent dancing teachers of Boston was a man named Shaffer, very well known and famous for his wit. When the stage-coach lines had reached the point of carrying their patrons for nothing and giving them wine and food in addition, Shaffer could stand the strain no longer. He dismissed his classes; closed his academy; abandoned his profession, and spent his entire time for more than a week in being carried back and forth between Providence and his own home, pausing between trips to enjoy the hospitality of the company he had deigned to honor with his patronage. The inevitable truce between the competing proprietors, and its attendant restoration of rates, was the catastrophe which sent the dancing master and many other of his townsmen back to their ordinary vocations. It was Shaffer who responded one day when an extraordinarily fat man descended from the stage-coach in front of a tavern and inquired how much the establishment charged for its dinner. Shaffer walked slowly around the new arrival, then backed away a few steps in order to get a better view, cocked his head to one side and said: "For that size, four dollars."

Thurlow Weed, in an account of a trip between Albany and Rochester, New York, in 1824, gives further insight into conditions encountered by stage-coach travelers. He says in his narrative:

"We left Albany at seven o'clock in the evening, and traveled diligently for seven nights and six days. The road from Albany to Schenectady, with the exception of two or three miles, was in a horrible condition, and that west of Schenectady, until we reached Tribe's Hill, still worse. For a few miles in the vicinity of Palatine Church there was a gravelly road over which the driver could raise a trot, but this was a luxury experienced in but few localities and those far between. Passengers walked to ease the coach every day and each night. Although they did not literally carry rails on their shoulders to pry the coach out of the ruts, they were frequently called upon to use rails for that purpose. Such snail-paced movements and such discomforts in travel would be regarded as unendurable now; and yet passengers were patient and some of them even cheerful, under all those ills and annoyances. That, however, was an exceptional passage. It was only when we had horrid bad roads that the stages dragged their slow length along."

Josiah Quincy left his observations of a stage journey from Philadelphia to Washington in February of 1826. The record was made in his diary and reads:

"At three o'clock this morning the light of a candle under the door and the rousing knock told me that it was time to depart, and shortly after I left Philadelphia by the Lancaster stage, otherwise a vast, illimitable wagon, with seats without backs, capable of holding some sixteen passengers with decent comfort to themselves, and actually encumbered with some dozen more. After riding until eight o'clock we reached the breakfast house, where we partook of a good meal, and took on Messrs. Storm and Wheaton. We then proceeded through a most beautiful tract of country with good fences and stone barns which proved the excellence of the farming. The roads seemed actually lined with Conestoga wagons each drawn by six stalwart horses and laden with farm produce."

On this trip Quincy went from Boston to New York in four days, from New York to Philadelphia in one day, and from Philadelphia to Washington in three days, making his entire time for the journey between Boston and Washington eight days. It was in the following year of 1827 that the work of building the Baltimore and Ohio Railroad was proposed, and Quincy's trip, therefore, furnishes a fair illustration of conditions attending stage-coach travel and of the time consumed by it just before the commencement of the railroad era.

Quincy also tells a story of a Massachusetts traveler who, at about the same period, was dashing through the town of Andover on a Sabbath day in his carriage, in defiance of the laws of the commonwealth, when he was halted and threatened with arrest by an indignant church deacon. But the wayfarer was equal to the emergency. Checking his horses and assuming an appearance of profound anxiety, he cried to the deacon, "Tell the good people of Andover that you permitted me to pass because my mother is lying dead in Boston"; and as the deacon recoiled a step from the news thus shouted to him, the traveler gave his horses their heads again and called back to the deacon, "You may add also, if you please, that she has been lying dead there for some twenty years." The carriage then disappeared in a cloud of dust.

Owing to the lack of bridges across the rivers, except in a few thickly settled districts and the immediate neighborhood of cities, any extended journey by coach or wagon necessitated frequent recourse to ferries. Many of these were nothing but rickety scows

whose pertinacity in holding together was often the marvel of those voyagers who sought their use, although they sometimes did fulfill expectations by collapsing or sinking under a too onerous burden. Nearly every passage of a river by ferry—except on a busy highway—was an hour of anxiety. An experience of the sort was apparently too familiar to the Americans for comment or chronicle, but a few visitors from other lands did leave accounts of such navigations. One of these wrote the following description of the manner in which he got his equipage across a stream :

“The next job was to ferry the baggage over; and this effected, the horse was towed across by the nose, an operation of some delicacy both to actors and spectators. Lastly came the transportation of the wagon, and here all my seamanship served only to show the hazard incurred of losing the whole conveyance. If the rope . . . old and much worn, had given way, as I fully expected it would, when the wagon was half-channel over and nothing in sight but four or five inches of railing above the water, we must have bivouac’d where we were. . . . Fortunately we succeeded in dragging the carriage across, and when the four wheels fairly touched the bank I thought of course that all our difficulties were over. But the united strength of all aboard, males and females, young and old combined, could not budge it more than a foot out of the water. I don’t know what we should have done had we not spied near the landing place a fathom or two of chain, one end of which our active little commanding officer soon tied to the carriage, and the horse being hitched to the other we drew it triumphantly to land, with a cheer that made the forest ring.”

During the second, third and fourth decades after 1800, nearly all the principal cities as far west as Pittsburgh were connected by several lines of stage-coaches. Certain of these lines carried the United States mails and made the quickest trips between the communities they served. The other lines maintained slower schedules. This phase of the varying land travel accommodations obtainable at that time is well illustrated in a volume dealing with the development of Pennsylvania. In its discussion of the service existing between Pittsburgh and Philadelphia in 1831, the book says :

“The announcement was made in the Pittsburgh papers of May, 1831, that Reeside, Slaymaker & Co. had, with their usual enterprise and public spirit, established four lines of stage coaches to run through to Philadelphia; the first in two and a half

days; the second in four days, both of them daily; the third to start tri-weekly, and the fourth to run daily in four days. . . . This was considered at the time a great advance upon the previous traveling facilities. The writer well recollects the advent of the fast mail line to run through in two and a half days. The coaches were built as light as possible consistent with strength and carried but six passengers each. The four-horse teams were carefully selected, and changed every ten miles. As the sound of the horn announced the approach of the stage to the changing station the fresh horses were brought out, each in charge of a groom, and the change was effected and the coach rolling away before the passengers hardly realized what was being done. The contrast to the old order of things was so marked as to excite a good deal of wonder and remark along the road."

By the year 1832 the trip between Boston and New York—in which Quincy but six years before had consumed four days—had been reduced to one of forty-one hours. In the last-named case, however, the passengers were not permitted to stop during the night at a tavern even for four or five hours of sleep, but were carried forward both day and night without intermission. At that time the swift-moving passenger between the two cities ordinarily paid a fare of eleven dollars. During the previous forty years the general improvements of roads throughout the east, coupled with competition, had resulted in a considerable reduction in the cost of stage-coach transportation. Whereas in 1832 a man could be conveyed from Boston to New York for eleven dollars, in 1783 and for some time thereafter the stage patron had been compelled to pay ten dollars for his passage between Boston and Hartford. Perhaps in a general way the decrease to the public in the cost of stage-coach travel amounted to about fifty per cent during the generation immediately following 1800.

In the winter time—except in those regions where snow was not a serious impediment to travel—the stage-coach lines sometimes placed their vehicles on sled bodies instead of wheels and succeeded in maintaining their service with but a small decrease in speed. On occasions when the ordinary stage-coach body would have been too heavy to be dragged through the snow its use was temporarily abandoned in favor of small, open, box-like structures, in which the travelers were exposed to all the inclemencies of the weather. The salient features of a winter trip to Philadelphia from New York in 1836 are thus stated:

"On the fourteenth of February, 1836, I left Philadelphia at 5 p. m., and was fourteen hours going to New York with the Great Southern Mail, although the sleighing was good. We rode in an open sleigh or box on runners, and the passengers sat on the mail-bag. The fare from Philadelphia to New York was six dollars."

The conditions of land travel just previous to the introduction of the canal and railway were very far from being uniform throughout the whole extent of territory east of the Mississippi. It was only in the northern and eastern sections of the country, and as far west as Pittsburgh, Wheeling and Washington, that there existed so favorable a situation as has been described. Some of the typical adventures to be expected by the man who journeyed west of Pittsburgh by stage, even at as late a day as 1837, are suggested in an account of an overland trip from Pittsburgh to the town of Erie, Pennsylvania, written by a Scotch civil engineer who traveled extensively through the country in the year named for the purpose of studying American public works. He said:

"On the road leading from Pittsburgh on the Ohio to the town of Erie, on the lake of that name, I saw all the varieties of forest road-making in great perfection. Sometimes our road lay for miles through extensive marshes, which we crossed by corduroy roads, formed of trees . . . cut in lengths of about ten or twelve feet and laid close to each other across the road to prevent the vehicles from sinking; at others the coach stuck fast in mud, from which it could be extricated only by the combined efforts of the coachman and passengers; and at one place we traveled for upward of a quarter of a mile through a forest flooded with water which stood to the height of several feet on many of the trees, and occasionally covered the naves of the coach-wheels. The distance of the route from Pittsburgh to Erie is one hundred and twenty-eight miles, which was accomplished in forty-six hours, being at the very slow rate of two miles and three-quarters an hour, although the conveyance by which I traveled carried the mail, and stopped only for breakfast, dinner and tea, but there was considerable delay caused by the coach being once upset and several times mired."

In the South the roads suitable for vehicles were still few and far between when compared with similar highways in the North, and much of the overland movement of the people, except on north-and-south roads near the coast, was still accomplished on horseback. During the second war with Great Britain communication by sailing

packets between the north Atlantic states and the southern seaboard was almost entirely cut off, and for commercial purposes there remained no method of intercourse between those two sections of the country save that afforded by the Conestoga wagons. Long trains of those land frigates departed daily from the northern cities toward the South, laden with commodities desired by the people of that region. As a natural consequence of the time and expense incurred in making a journey by that means from the North to the South, the expense of conveying goods between the two regions was extraordinarily high. The freight rate by Conestoga wagon from Boston to Charleston was no less than forty cents a pound for goods of light weight, or eight hundred dollars a ton.

From ten to twenty overland wagons that had started from Baltimore, New Haven, New York, Philadelphia, Boston and Richmond arrived in Charleston every day during a considerable period of the War of 1812, so that if the various charges on the goods carried by them averaged but ten cents a pound, the aggregate freight costs for ten or twenty wagon loads of articles so transported from the North to that one city would have been between four thousand and eight thousand dollars a day. Not all this merchandise, of course, was destined for Charleston. Much of it went still farther south to other communities.

This long interruption of sea travel by means of the swift sailing packets that had hitherto united the northern and southern ports really proved a stimulus to the development of land movement between the two sections, for it forced the people to an increased use of stage-coaches and to the betterment of their roads. After the war the Atlantic sailing packets never wholly recovered their previous prestige as passenger carriers. Within a dozen years little steamboats appeared on the various bays and rivers, and in course of time those mechanical craft began running in close business connection with various southern stage lines. Thus was forming a new system that competed for and secured a large portion of the human traffic between North and South until railways supplanted the stage-coach part of the coalition.

Other conditions that retarded the development of travel facilities in the South between 1800 and 1830, have been outlined in those chapters dealing with the diplomatic conflict between the white and red races. Land travel from the South to the West—save on three or four roads leading through Virginia and North Carolina to Tennessee and Kentucky—was still a matter of considerable toil. Yet

the communication facilities between the East and the Mississippi were showing a marked improvement when compared with the situation that had existed a few years before. An illustration of the progress made in bringing the East and the extreme West more closely together is that contained in the respective intervals of time which were required to carry the President's message from Washington to Little Rock, Arkansas, in 1819 and in 1829. The message of December 7, 1819, was seventy-eight days on its journey to Little Rock, and did not arrive in that town until February 22, of 1820. Jackson's annual message of December 8, 1829, in contrast, was hurried from Washington to Little Rock in the astonishing time of fourteen days. A local newspaper commented on the prodigy in the following words: "Thus have the improvements which have been made in the expedition of our mails brought us, as it were, sixty-four days nearer the city of the General Government than we were ten years ago." Doubtless the editor who uttered this encomium on the progress of his day thought that the possibilities of development had about reached their limit.

The disabilities under which the people of the West labored, from the beginning of the century until about 1825, are suggested by an observation of Christopher Schultz in his "Travels on an Inland Voyage." Schultz remarks: "If the mud does not get quite over your boot tops when you sit in the saddle they call it a middling good road."

The observation here quoted is a humorous exaggeration, but it is nevertheless true that any human movement over the so-called roads of the Middle West was at certain times out of the question. In the rainy season, in fact, vehicle traffic was not even attempted throughout large districts of the country and travel was performed on horseback or not at all.

Another description of early western road conditions, somewhat more elaborate than that of Schultz, is contained in Charles Cleaver's "History of Chicago from 1833 to 1892; Describing the Difficulties of the Route from New York to Chicago." In his reminiscences of the conditions he encountered in the village of Chicago during 1833 and thereafter, Cleaver says:

"Parties informed us that in the spring we would find it almost impossible to get around for the mud—a truth very forcibly illustrated when a few months later I got into a wagon to go about one and a half miles northwest. . . . It was with the greatest difficulty that two good horses could pull the empty wagon

through the two feet of mud and water across the prairie we had to cross. I once heard Mr. Elston's place called 'the mud farm,' not an inappropriate name for it at that time. A year or two later I saw many teams stuck fast in the streets of the village. I remember once a stage coach got mired in Clark Street opposite the Sherman House, where it remained several days with a board driven into the mud at the side of it bearing this inscription: 'No bottom here.' I once saw a lady stuck in the mud in the middle of Randolph Street at the crossing of La Salle. She was evidently in need of help, as every time she moved she sank deeper and deeper. An old gentleman from the country, seeing the situation, offered to help her, which had such an effect upon her modesty that with one desperate effort she drew her feet out minus her shoes, which were afterward found over a foot in the mire, and reached the sidewalk in her stockings."

At the time Henry Clay was making his appeal for a national highway between the East and the West, it usually required about three or four weeks to travel from New York or Washington to Cincinnati, Corydon, or St. Louis. In a copy of the *Western Censor and Emigrant's Guide*, published in Indianapolis on January 19, 1824, appeared a little paragraph indicating that the latest news from the state capital was dated January tenth. Eight days, therefore, had been required to span the distance between Corydon and Indianapolis. In the same issue of the *Western Censor* appeared another item indicating that the most recent information received from Washington was dated December twenty-seventh. More than three weeks had elapsed between the departure of the letters from the national capital and their arrival at Indianapolis.

The first number of the *Western Censor*—that of March 7, 1823—contains a communication describing an overland trip between Indianapolis and Fort Armstrong, four hundred miles north of St. Louis. It was made by Israel Mitchell and a small party of Indiana people. They were twenty-three days on the way. In telling of the journey Mitchell said: "We suffered more than can well be imagined from wet, cold and hunger, being wet to the knees and often to the neck. The streams through Illinois were all high, and had no timber on them to make rafts, and we had no alternative left but to swim. Had it not been for honey we must have nearly perished. We had not a full meal of meat for thirteen days, and for four days nothing but honey. . . . Fasting and fatigue have weakened us very much." Mitchell also mentioned that a steamboat named Vir-

ginia had recently reached Fort Armstrong from Wheeling, in Virginia, after a voyage of three weeks. This was the first steamboat to penetrate so far up the Mississippi River.

It was not until the year 1820 that the upper part of the Mississippi valley found itself in fairly reliable and regular communication with the eastern states. Even then the new era in overland rapid transit was at first mainly concerned with the delivery of the mails. The routes used were the old roads—and their later continuations—which extended westward through the mountains and into Tennessee and Kentucky. A St. Louis newspaper of 1820 mentions the revolution in the speed of the mails in the following paragraph:

“After the vexatious delays which we have been long subjected to in our mail communication with the Atlantic states, it is a matter of agreeable satisfaction to find a line established on which dependence can be placed. On the Vincennes route we now have regular arrivals from the principal towns in Kentucky and Ohio in six days, from Washington and Baltimore in twenty, Philadelphia twenty-one, New York twenty-two, and Boston twenty-four.”

From this it will be seen that by special effort a man might, at that date, proceed overland from New York to St. Louis in but little more than three weeks, and that only six days were required to go from Cincinnati or Louisville to the town on the western bank of the Mississippi. Passenger stage-coaches appeared on the western part of this route a few months later. An Indiana newspaper of 1820 announced certain new facilities for travel then impending in a paragraph which read:

“We are gratified in seeing it announced that a line of stages is established to run from Louisville through Vincennes to St. Louis. This will be an invaluable accommodation to travelers to the West, who have hitherto been obliged to resort to tedious and vexatious means of conveyance. We are glad also to see the progress of public improvement. Comfortable houses and good farms are creating on the St. Louis road, and a stage coach with passengers will soon be humming across those vast and cheerless prairies, where, but a short time since, the wolf and deer were the principal inhabitants, or men in savage attire, as ferocious and wild as they. The benefits of the enterprise of Mr. Foyles will be felt and acknowledged by many a grateful traveler, and we hope it will receive the particular attention of the Postmaster-General.”

This overland movement to the West, aided by Mr. Foyles, followed the earlier Kentucky roads to Louisville. There the travelers crossed to the north side of the Ohio, and by means of the old Vincennes trail—recently widened and improved—they proceeded to the second capital of Indiana territory and then swung westward across Illinois. On this and some other of the early roads of the West the pioneer stage-coach companies adopted a rule which caused a considerable fluctuation in the rates of fare which passengers were charged for their transportation. A traveler was arbitrarily considered to weigh one hundred pounds. As the "Mail Stage Rules" of the Emison and McClure Company put it, "one hundred pounds weight will constitute a passenger, and to be paid for accordingly, and a greater or less weight in proportion." So it will be seen that if a traveler had the misfortune to weigh one hundred and fifty pounds he would, according to the regulations, constitute a passenger and a half, and would be compelled to pay for himself on that basis; and if he tipped the scales at two hundred pounds he then represented two persons, as far as the price of his ticket was concerned. He was, however, allowed to carry fifteen pounds of excess weight in the stage, provided the said fifteen pounds was baggage and not a component part of his own person. Rule number nineteen of the Emison and McClure Company disclaimed responsibility for the loss of any trunks or other baggage carried by coach. Aside from these features of administration, which were doubtless common to all or nearly all the early stage companies of the interior, their rules indicated a real and business-like desire to satisfy their patrons. The employes of the companies were forbidden to indulge in language or conduct that was unseemly, and were instructed to treat passengers with "the utmost politeness."

Although by this time there were numerous stage routes in the eastern states on which travelers went forward toward their destinations both by day and night without intermission, the newer roads in the interior did not permit a like procedure, and the speed attained by the pioneer stage lines of the Middle West was but a fraction of that accomplished by the eastern lines of the same years. The schedules of the first coaches running over the road between Louisville and Vincennes were announced to the public by means of advertisements when the service was projected, and one of these announcements read:

"The Vincennes stage to Louisville leaves Francis Cunningham's in Market Street, Vincennes, on Wednesday mornings at

six o'clock, arrives in Louisville at three o'clock p. m. on the Friday following, leaves Louisville on Saturday morning at six o'clock, and returns to Vincennes on the Monday following at three o'clock p. m., distance to Louisville one hundred and twenty-six miles."

Including the two nights spent on the road between the cities named, it consequently appears that the traveler proceeded at an average rate of less than two and one-fourth miles an hour. The running schedule for that part of the journey between Vincennes and St. Louis was as follows:

"The Union Line of stages, in conjunction with the Louisville Line, will commence on the fifth day of September, inst., to run regular from Vincennes, Ind., to St. Louis, Mo., to leave Vincennes every Tuesday at two o'clock p. m., arrive at St. Louis on Friday by two o'clock p. m. Leave St. Louis on every Saturday at half past four a. m., and arrive at Vincennes on Monday by six p. m."

Similar advertisements, published during the next few years in the same parts of the country, showed that an average rate of movement not exceeding three miles an hour was all that could be expected by stage-coach during any extended journey which required one or more nights on the road. A man journeying from Vincennes to St. Louis by the road and in the manner here outlined spent three days in crossing the State of Illinois.

A considerable traffic soon appeared on this first of the "through routes" of the Middle West, and two other necessary conveniences of travel—in addition to the stage-coaches themselves—speedily multiplied. These were the taverns and the ferries. Innkeepers and ferry proprietors competed almost as actively for traffic as did the coach lines themselves, and their representatives always met the incoming stages, distributing to the passengers printed handbills which called to their attention the excellencies or conveniences of the institutions whose interests they advocated. Although it often happened that a stage-coach company owned, or had an interest in, several of the taverns along its route, and although the coaches of any given line always stopped at one particular inn, there was no obligation on the part of the travelers themselves to patronize taverns with which their conveyances were affiliated, and constant efforts were made by rival landlords and ferrymen to secure patronage. A steady stream of westward-bound emigrants also moved through the country either in their own canvas-covered wagons or on

horseback, and these were likewise the legitimate prey of all those who represented any feature of the new transportation facilities that were so rapidly coming into existence.

The position held by a stage-coach driver of the old days, in the estimation of his acquaintances and the general public, was very similar to that of the captain of a steamboat. Some famous drivers, indeed, stood on so lofty a plane in the eyes of the world that they can only be likened to the commanders of the ocean steamships of the present time. By virtue of their duties they came into constant contact with all the prominent political, social and commercial figures of the country. Their attention and favorable opinion were also always sought by that large—though less consequential—part of the public which was so deeply impressed by the measure of their responsibility and the majestic demeanor of their professional attitude. The high place occupied by a famous stage driver in the eyes of the youth of the country during the heyday of stage travel is suggested by the words of one who was familiar with the life of those days. He said:

“My earliest recollections are intimately associated with coaches, teams and drivers, and, like most boys raised in an old stage tavern, I longed to be a man, when I could aspire to the greatness and dignity of a professional stage driver. In my boyish eyes no position in life had so many attractions as that of driving a stage team. A Judge, a Congressman, even Henry Clay or President Jackson did not measure up to the character of John Mills or Charley Howell in my juvenile fancy.”

Nor was this estimate of the coach driver confined exclusively to people other than the driver himself. There is a record that one of the fraternity once remarked, “While I drive this coach I am the whole United States of America.” Yet the ordinary wage of a driver was only twelve dollars a month, exclusive of his board and lodging. While on duty he took his meals at the taverns along the road in company with his passengers—though he did not sit at the head of the table—and he was always sure of a bed to himself, no matter how urgently and vainly some belated traveler might plead for a like accommodation.

It was a time in which the free use of intoxicating drinks—especially of brandy and whisky—was more common than it is today, and stage-coach drivers, like a large majority of other men, drank whenever they had the opportunity and the inclination, yet it should be said to their credit that few of them permitted themselves to be

reduced to the condition which made them incapable of performing their really important work in a safe and proper manner. They were so continually pestered with invitations to drink that they might easily have remained in a state of partial incapacity for months at a time, provided they were permitted to retain their official positions during such an interval.

But it occasionally happened that a driver was false to his duty and forgot the value of the lives entrusted to his care. In cases of that sort disastrous accidents sometimes resulted. One such accident, which occurred in Massachusetts in 1835, received the following newspaper comment :

"The driver, on taking charge of the team at Groton, was observed to be not very well capable of managing his team, which was observed by several persons, one of whom remarked on his incapacity to drive. It is not pretended that he was drunk at the time, but laboring under the stupefying effects of intoxication. After the arrival of the stage at a place called Littleton he took his glass of grog. Mr. Bullard, proprietor of this line of stages, rode on the box with him and had occasion to arouse him from sleep twice after leaving Groton. Mr. Bullard was still on the box with the driver when they left Littleton. On arriving at the summit of the hill where the accident happened the driver was unable to control his team, four spirited horses, and they ran full speed down the hill, coming in contact with Mr. Powers' six-horse loaded wagon . . . which upset the coach. Mr. Bullard, holding on the railing of the coach as it turned over, swung round and under it upon his side. . . . Previous to expiring, Mr. Bullard communicated to those in attendance the facts above stated."

In noting this fatality, which was due to the condition of the driver, the same journal declared: "There is hardly a class of men whose sobriety and habits of carefulness are of as great importance as that of stage drivers. So far as our circumscribed vision extends in regard to this matter, the public around us are happily provided for in this respect; but this is not the case in all places."

One phase of the incident here narrated seems to be worthy of elucidation. The newspaper said, "It is not pretended that he was drunk at the time," but that "he was laboring under the stupefying effects of intoxication." Obviously a distinction is here asserted which the lapse of years has obliterated, and it is, in consequence, necessary to explain that during the period under discussion a man

was not pronounced "drunk" unless he was prostrate and unconscious. While he still manifested any glimmering of understanding, or was able to make a distinguishable physical movement, the opprobrium attached to the stronger description could not fairly be applied to him. Until that condition had arrived he was, as explained in connection with the above case, merely "under the stupefying effects of intoxication."

Minor accidents were constantly taking place in the operation of the stages, but it was seldom that a mishap resulted in such unfortunate consequences as those which accompanied the runaway near Groton. Usually a vehicle was overturned and its occupants received a bad shaking up and some bruises; occasionally some one suffered a broken limb. Nor were the elect of the land any more immune from such happenings than the most humble traveler. Even Henry Clay himself, to whose influence more than that of any other man the creation of the National Road was due, was involved on one occasion in an upset. He was on his way to Washington at the time, and the driver overturned the coach at Uniontown, in Pennsylvania. The Idol of the West was unhurt, and when he was dragged out of the vehicle he remarked that the Clay of Kentucky had been mixed with the limestone of Pennsylvania. The driver, jolted from his lofty perch by the concussion, alighted on his head and suffered a broken nose.

Another prominent stage-coach passenger who passed through a similar experience was the Indian, Black Hawk. After his capture he was taken to Washington, and journeyed eastward by steamboat on the Ohio River until Wheeling was reached. There he and the entire party of military men and Indians were transferred to coaches and set out over the National Road. While passing through the town of Washington, in Pennsylvania, the driver lost control of the team behind which sat Black Hawk and eight other natives, and after a mad down-hill dash the vehicle left its wheels and rolled over. Black Hawk was the first of the party to emerge, and standing in the street, surrounded by the crowd which speedily gathered, he made a number of remarks in a loud and emphatic tone of voice. Owing to the excitement of the moment no record of the Sac's extemporaneous address was made, but it is safe to say that his opinion of the particular phase of Caucasian civilization with which he had thus suddenly come in contact was not radically different from the opinion that would have been expressed by a white man under similar conditions.

The coming of the railroad and the spread of that new method of movement throughout the East spelled the ultimate doom of stage-coach travel along the National Road and other roads in that part of the country. Various stage lines, nevertheless, fought hard and well to retain a vestige of their former glory, and some of them succeeded in maintaining a precarious existence until after 1850. But their day as a factor in the upbuilding of the country and in the movement of its population was practically done, and they were destined to survive only amid the sparsely settled regions of the almost limitless West. During the last two or three years in which the old National Road still remained an essential factor in the traffic of the nation the voice of a driver along its way could sometimes be heard as he chanted this ditty in execration of the portentous change that had robbed him of his occupation:

“Now all you jolly wagoners, who have got good wives,
Go home to your farms and there spend your lives.
When your corn is all cribbed, and your small grain is good,
You will have nothing to do but curse the railroad.”

But long before the stage coach and turnpike had ceased to be important factors in the national travel system, a new and radically different method of transportation—the artificial waterway, or canal—had appeared, which was destined for about a generation to play an interesting part in the country's development.

PROSPECTUS OF A PIONEER PRAIRIE RAILROAD

FROM A PAMPHLET PRINTED AT BOSTON IN 1847

At the last session of the Illinois Legislature, a company was incorporated for building a Railroad to connect Alton and Springfield, in that State. Five hundred thousand dollars with power to increase the same to \$1,000,000, was made the capital stock of the company. Books for subscription to this stock were opened in May last, both at Alton and Springfield, and \$100,000 have been subscribed. The charter requires that \$500,000 be subscribed, before the company can be organized and the work commenced. Of this, it is desired to raise the amount not taken, from Eastern capitalists, with whom are more abundant means, greater experience in investments of this character, and a better understanding of the economy of expediture in the construction and management of such works, than our own citizens possess. The undersigned have been deputed to visit Boston and other eastern cities, as commissioners to solicit subscriptions for filling the stock, and as exhibiting some of the inducements that are offered to capitalists in this region to subscribe, they would submit the following statements:

IMPORTANCE OF THE ROUTE.

If ever a line of Railroads shall be completed, uniting Boston and New York, with the Mississippi river, the road from Alton and Springfield must form a link in the connecting chain. The great point on the Mississippi river to be reached, is St. Louis. Above this, Alton is only twenty miles on the river, and at the nearest point, where the bluffs unite with its bank, and where a secure connection with it can be obtained. There is now between these places a communication by a double line of daily packets, and the distance can be run in going down the river in the short space of an hour, and in returning, in an hour and a half. Alton is also at the head of navigation for the largest class of Steamboats. It is but three miles above the mouth of the Missouri river, and fifteen below the mouth of the Illinois. It is also on the extreme point of that bend in the river, where it makes its greatest sweep into the State, and thus forms a centre of a large tract of very rich and highly cultivated

country. A large amount of produce is shipped from this point to New Orleans, with which the river affords a constant communication throughout the year, save an occasional suspension of from one to four weeks during the severest winters. Springfield, the other terminus of the proposed road, is the Capital of the State, situated in its very heart and in the centre of its most populous and productive region. It is directly on the land route from Chicago to St. Louis, and is connected by stage and mail routes with every important point in the State. In fact, the great proportion of travel through Illinois, centers at Springfield. It is one of the termini of the "Sangamon and Morgan Railroad," leading by way of New Berlin and Jacksonville, to Meredosia, on the Illinois—a road originally built by the State of Illinois, and known as the "Northern Cross Railroad." This road has recently been sold to a company that will immediately put it in good repair, and have it in operation by the next summer. This company have the right of extending their road east, in the direction of La Fayette, to the Indiana State line, on the route previously located by the State, and for this purpose all the materials, grade and work done by the State east of Springfield, amounting in value to more than \$200,000, were granted to them. If this road is constructed to that point, as it undoubtedly will be within a few years, a road running to La Fayette, in Indiana, and connecting with it, for which a charter has been obtained, will also be built, and from thence a connection can easily be made with the Michigan Central Railroad at New Buffalo, or at Michigan City. It would also be connected with Indianapolis by a road from La Fayette, which is now about being put under contract. The importance and necessity even, of this continued line of communication must be apparent to every one, when it is remembered that at present there is a constant tide of travel and emigration pouring from the east to the Mississippi river, that after leaving the lakes, the only mode of public conveyance now offered is by stages, and by boats, on the Illinois river, and that only during about from three to four months in the year is this river in a suitable state of navigation, either for the cheap transmission of freights, or the safe, speedy, and comfortable conveyance of passengers. The public wants and interest, call for some easier, cheaper, and speedier communication—and the building of the Alton and Springfield Railroad, is the first step to be taken in providing the same.

CHEAPNESS OF CONSTRUCTION.

The distance from Alton to Springfield on the route proposed, is eighty miles. But by the charter, the company is authorized to connect with the "Northern Cross Rail Road," (now known by the name of the "Sangamon and Morgan Railroad,") at New Berlin, and use so much of the same between Jacksonville and Springfield, as they shall deem necessary, paying for the use thereof such sum as shall be mutually agreed upon between the parties, and in case of disagreement, as shall be determined upon by the Judge of the Sangamon Judicial Circuit. This charter was granted previous to the sale of the road by the State. The distance from New Berlin to Springfield, is sixteen miles. But sixty-four miles of road remain therefore to be built. Of this sixty-four miles, thirteen miles of grade, extending from Alton out, has been nearly completed by the State, which the company is authorized to use. Only fifty-one miles then are required to be graded. These fifty-one miles pass over a level prairie country, almost fitted by nature to receive the rail. Probably nowhere in the United States can the same extent be found requiring less expenditure for grading than this distance. No survey of this identical route throughout its whole length has been made, and we are not therefore able to furnish certain estimates of what will be the cost of grading this portion of it. A survey was made in 1835, by General Mitchell, of Pennsylvania, of a route from Alton to Springfield, passing over a part of this. A copy of his report will be found in the Appendix. From his estimates, and also from the returns of the State Engineer who had the charge of the thirteen miles of grade constructed by the State, we are enabled to arrive, as we think, to a close approximation of what must be the cost of grading the fifty-one miles. The average cost per mile of grading and bridging the route surveyed by General Mitchell, as estimated by him, was \$2,873.30. This includes more heavy work than is embraced in that part of our route not graded, and some deduction therefor must be made. The contract price entered into by the State for grading the thirteen miles before mentioned, was at an average of \$3,956.95 per mile. This includes by far the heaviest work on the whole route, it being the ascent from the Mississippi river to the top of the bluffs, or to the table land. Taking, therefore, as the basis of our calculation, the estimates of General Mitchell and the contract price for the thirteen miles, we

think that the cost of grading the fifty-one miles, may safely be set down at an average not exceeding \$2,500 per mile, or \$127,500 for the whole distance. If this be correct, we may calculate the cost of the road as follows:

Grading and bridging from Brighton to New Berlin, 51 miles.....	\$127,500
Repairing 13 miles graded.....	7,000
Cost of right of way, not already secured.....	5,000
64 miles heavy T. Rail, at <u>\$72 per ton</u> , 90 tons to the mile.....	414,720
Chairs, spikes, ties, plank and laying track, \$1,700 per mile.....	108,800
Contingencies, engineering, etc., say.....	40,000
Depots, cars, locomotives, etc., say.....	80,000
	<hr/>
	\$783,020

This is equal to an average of about \$12,234 per mile, for the 64 miles. Is this too low an estimate? We think it full high. Gen. Mitchell estimates the average cost per mile of constructing the Railroad surveyed by him at \$6,831.21, with the flat rail. Deducting the cost of flat rail (\$1,650,) and add cost of heavy T Rail (\$6,480,) and we have for the cost of road per mile, \$11,661.21. The contract price for building the thirteen miles before mentioned, ready to receive the flat iron rail, was, according to the Engineer's returns, \$7,484 per mile. Deduct the difference in average cost per mile of grading the fifty-one miles according to our estimate, (\$1,456.75,) and add cost of heavy T Rail (\$6,486,) and we have \$12,507 per mile. A further allowance should be made for the difference in the cost of the superstructure for receiving the rail. If our estimates are correct the sixty-four miles of Railroad can be built in the most substantial manner, for a sum less than \$800,000. Add to this that the use of sixteen miles more can be had at a moderate toll—probably not exceeding the one-half of six per cent. on its cost, and half the expense of its repairs—and a Railroad of eighty miles in length can be had at the moderate cost of but little more than \$10,000 per mile. The Michigan Central Railroad, bought from the State on the most favorable terms, will, by the time it is completed, have cost its present owners more than this. So far as cheapness of construction is concerned, we do not believe there is a road in the United States that has been built, or is to be built, that presents such favorable inducements for the taking of stock, as the Railroad from Alton to Springfield. As this is an item entering largely into the estimate of profits, it certainly is a most important one.

ESTIMATES OF THE BUSINESS OF THE ROAD.

The counties through which the proposed Road will pass, are Sangamon, Macoupin, and Madison. Those which must be tributary to it, and whose products it will drain, are, in addition to the above-enumerated, Logan, Christian, Macon, Moultrie, Menard, Piatt, and De Witt, and parts of Shelby, Montgomery, McLean, Tazewell, Cass, Morgan, Greene, and Jersey. The population of these counties in 1845 was 133,652. Making a suitable deduction for those counties that would be tributary but in part, and add the population of St. Louis, which is at the present time 50,000, and we have an adjacent population of at least 150,000, for which this road must do more or less business. It is also to be remembered that this is a population rapidly increasing. The ratio of increase in the whole State from 1840 to 1845, was over 33 per cent. It was not less in these counties. In the same period, St. Louis has more than doubled her population. The productions of the above counties in the year 1840, as appears by the returns of the United States Marshal for that year, were as follows:

Corn	7,800,833 bushels
Wheat	766,329 bushels
Oats	1,167,682 bushels
Barley	28,737 bushels
Potatoes	386,083 bushels
Hay	31,103 tons
Hemp and flax.....	316 tons
Meat Cattle	169,934
Swine	399,101
Sheep	128,785
Wool	213,943 pounds

The increase of products has been in a much greater ratio than that of the population. The quantity of corn, oats, and potatoes raised the present year must be double that of 1840; of wheat and barley, triple. The number of sheep has increased five fold. No account is here made of buckwheat, rye, tobacco, beans, onions, cabbages, hops, wax, the products of the dairy, and fruit, all of which are raised and produced in large quantities. Some estimate can therefore be formed of the heavy amount of freight business that will be done on this road when completed. The following estimate has been made by prudent men well acquainted with the capacities, resources, and business of the country, which would certainly seem to be within bounds:

Flour, 100,000 barrels, at 25 cents per barrel.....	\$ 25,000
Wheat, 300,000 bushels, at 7 cents per bushel.....	21,000
Corn, 1,500,000 bushels at 5 cents per bushel.....	75,000
Corn Meal, 50,000 barrels, at 25 cents per barrel.....	12,500
Oats, 400,000 bushels, at 4 cents per bushel.....	16,000
Barley, 50,000 bushels at 5 cents per bushel.....	2,500
Potatoes, 50,000 barrels, at 25 cents per barrel.....	12,500
Pork, 10,000 barrels, at 37½ cents per barrel.....	3,750
Bacon, 2,000,000 pounds, at 15 cents per hundred.....	3,000
Lard, 1,000 barrels, at 37 1-2 cents per barrel.....	375
Lard, 12,000 kegs, at 7 cents per keg.....	840
Beef, 10,000 barrels, at 37½ cents per barrel.....	3,750
Tallow, 300,000 pounds, at 12½ cents per hundred.....	375
Hides, dry, 300,000 pounds, at 30 cents per hundred.....	900
Live Hogs, 20,000, at 50 cents each.....	10,000
Fat Beeves, 3,000, at \$1.50 each.....	4,500
Sheep, 10,000, at 25 cents each.....	2,500
Whisky, 5,000 barrels, at 40 cents per barrel.....	2,000
Wool, 200,000 pounds, at 20 cents per hundred.....	4,000
Hemp, 300 tons, at \$3.00 per ton.....	900
Hay, 2,000 tons, at \$3.00 per ton.....	6,000
Merchandise of all kinds, 10,000 tons, at \$3.00 per ton.....	30,000
Lumber (Pine), B. M. 1,000,000, at \$3.50 per M.....	3,000
	<hr/>
	\$240,390

The number of average through passengers that would daily pass over the road, may safely be estimated at 100. This, for three hundred days in the year, would make 30,000. At \$2.50 each the receipts from this source would be.....\$ 75,000
Transportation of the mail (say)..... 4,000

Gross annual receipts.....	\$319,390
Deduct for expense of running, repairs, etc., \$1,200 per mile.....	76,800
Net receipts per year.....	<hr/> \$242,590

From this a deduction must be made for the amount that will have to be paid the Sangamon & Morgan Railroad Company, for the use of the sixteen miles from Springfield to New Berlin. Making every allowance, however, if our estimates are correct, the road, when built, cannot fail to pay a dividend of 25%.

That the results will more than verify these estimates we have the utmost confidence. Numerous other products than those mentioned, must pass over this road when built, to market, which will be more than sufficient to make good any errors that may be found in our calculations.

We submit, therefore, the above statements to the examination of those who may feel interested in connecting the Mississippi River, by Railroad, with the Eastern cities, and disposed to aid us in our enterprise.

ROBERT SMITH,
S. RYDER,

V. HICKOX,
JOHN WILLIAMS.

Boston, August, 1847.

APPENDIX

To the Commissioners appointed by the Charter of the Springfield and Alton Turnpike or Railroad Company, the Executive Committee of the Carlinville Convention, under the direction of that body would respectfully report, that in pursuance of the duty delegated to them, they have caused to be surveyed an average route for a Railroad from Springfield through Carlinville to Alton. That the work has been performed by Gen. W. B. Mitchell, of Pennsylvania, the testimonials of whose qualifications and ability as a civil Engineer, are of the most ample and satisfactory nature. From him they have received the following report, accompanied with extensive plans and profiles, which are herewith submitted to the disposition of the commissioners.

TO THE EXECUTIVE COMMITTEE OF THE ALTON AND SPRINGFIELD RAILWAY.

Gentlemen:—In compliance with an engagement made with your Committee on the 16th of June last, I have proceeded to make a survey and estimate of a Railway from Alton to Springfield, the maps and profiles of which accompany this report.

The survey was commenced on the bank of the Mississippi at the steamboat landing, at State street in Alton, and continued through Brown's Prairie, by Carlinville and Otter Point, to the line of the incorporated limits of Springfield, being a distance of seventy-two miles and eighteen chains. No definite termination has been made of the line at Springfield, on account of its being equally convenient to enter the town at any point which the directors of the Railway may hereafter deem most expedient. The general face of the country presents uncommon facilities for the construction of a Railway, and were it not for the necessity of crossing several streams where considerable excavation and embankment are required, the cost of the grading would be reduced to a very small amount. In commencing the location at Alton, the greatest difficulty presented itself at the outset; the Mississippi bluffs approaching the river at an elevation of two hundred and eight feet above its waters at medium height, afforded but little hope of acquiring sufficient distance to attain the summit by an admissible grade. Much labor and time was bestowed upon the examination of every *supposed* practicable pass, which resulted in a conviction of the necessity of adopting an inclined plane. To render the alternative as unobjectionable as possible, the location was made along the little Piasa Creek as far as the valley of that stream would accommodate the grade, being a distance of one mile. From this point, an inclined plane having an elevation of one hundred and twelve feet, with a base line of eighteen hundred and forty-four feet, reaches the elevation of the first bench of the table lands, from whence a grade at the rate of thirty feet per mile passes the summit at Howards. The following table of grades will afford a view of the general face of the country through which the location has been made, from the inclined plane near Alton to Springfield:

	Miles.	Chains.
Level	8	3
Under 3 feet per mile.....	16	64
Under 5 feet per mile.....	7	8
Under 10 feet per mile.....	14	54
Under 15 feet per mile.....	6	52
Under 20 feet per mile.....	6	78
Under 25 feet per mile.....	1	22
Under 27 feet per mile.....	2	68
Under 30 feet per mile.....	6	42
	<hr/> 70	<hr/> 71

In order to afford the greatest facilities for the use of steam as a motive power, no grade was adopted exceeding thirty feet per mile, and the shortest radius of curvature is *eighteen hundred feet*. The situation and inclination of the plane is such as to admit its being used advantageously by animal power, or a reciprocating rope may be employed so as to allow the descending teams to draw up those ascending, and for the accomplishment of this object the coal banks in the immediate vicinity of the head of the plane, and the inexhaustible beds of limestone at Alton, which is in much demand in the interior, will furnish a constant and profitable means of acquiring the requisite preponderance in either direction.

The following abstract will exhibit the estimated expenditure required to construct the Railway:

Excavation, 665,467 cubic yards, at 8 cents.....	\$ 53,237.36
Embankment, 571,167 do.....	68,440.04
Mason work at Bridges and Culvert, 10,814 perches, at \$3.35.....	35,145.50
Wood superstructure of Creek Bridges.....	6,930.00
Ravine Bridges	1,994.70
Side ditches	5,500.00
Framework on Embankments.....	10,050.00
Grubbing and clearing.....	700.00
	<hr/>
	\$181,997.60
Add for contingencies.....	18,809.76
	<hr/>
Cost of Grading and Bridging.....	\$200,807.36
SUPERSTRUCTURE.	
1,600 tons of flat iron, 2¼ by ½ inches, at \$66.00.....	105,600.00
16 tons spike and splicing plates, at \$117.00.....	1,989.00
2,281,000 feet board measure of bearing plank, at \$20.00 per M.....	45,620.00
95,040 cross sills, at 30 cents each.....	28,512.00
760,320 lineal feet of wood rail, at 6 cents.....	45,619.00
Workmanship in laying track.....	57,600.00
	<hr/>
	\$284,940.00
Add cost of superstructure.....	206,907.36
	<hr/>
Cost of Railway.....	\$491,847.36
Average cost per mile when completed.....	6,831.21

This estimate may be considerably reduced by an economical management on the part of the company—the cost of delivering iron has been calculated at the present high rate of freight from New Orleans to Alton; but if the Company would charter a steamboat for that purpose, a saving to the amount of at least \$12,000 would be effected. Another large item of expenditure included in this estimate is the cost of sawed timber. It is believed that if the Company would purchase timberlands at two or more convenient points along the route, and erect steam sawmills, a reduction in the cost of timber to the amount of \$18,000 might be safely calculated upon. If this course be pursued the whole cost of the road would be \$461,847.00, or \$6,414.50 per mile. The grading has been estimated for single track with the exception of the Creek Bridges, which have been calculated of sufficient width to accommodate two tracks, should that be found necessary, as in all probability it will at no distant period.

If the estimated expense exceed the calculation of the projectors of this improvement, it must principally be attributed to a desire of rendering the location in every respect worthy of the great thoroughfare of which this work is designed to become a part. The immense natural resources of the country and its rapidly increasing population, together with the uncommon facilities which the State of Illinois presents for the construction of Railways in every direction, would appear to indicate a continuation of this improvement to the Wabash and Erie Canal at an early period. Should that project be carried into effect it will open at once a direct and expeditious channel of communication with the eastern markets, by the Canals and Railways of Indiana, Ohio, New York and Pennsylvania. The geographical position of Alton leaves no doubt of its great importance in a commercial point of view, commanding as it does the trade of the Missouri, Upper Mississippi, and Illinois rivers, with their numerous navigable tributaries, and when it is considered that the greater proportion of this trade will pass towards the east as soon as the contemplated connection with the Wabash Canal shall be completed, it leaves no reason to question the propriety of adopting such a location of the Alton and Springfield Railway as will render it a proper and convenient avenue for the conveyance of the immense amount of property and traveling which will soon pass upon it. The completion of the New York and Erie Railway will add much to the importance and value of this improvement. The accomplishment of these objects will allow of passengers and merchants being transported from New York to Alton and St. Louis in eight or nine days, and those who have observed the concourse, of travelers passing to and from the West, by the present circuitous route, will not deem the assertion extravagant that passengers alone will yield a profitable return for the capital required to complete this Railway. These considerations have induced me to bestow more time in making the location than was at first deemed necessary, and the route selected has been chosen on account of the importance of the improvement rather than with the view of avoiding an increased expenditure in its construction.

Respectfully submitted,

W. B. MITCHELL, *Engineer.*

September 10th, 1835.

PRESSING NEED OF A CONSTRUCTIVE RAILWAY POLICY*

BY SAMUEL REA,

PRESIDENT, PENNSYLVANIA RAILROAD COMPANY.

Although holding no commission to speak for the railroads as a whole, the seriousness of their present position may warrant an expression of my views on the general railroad situation. I therefore appreciate the fitting opportunity you have given me to present certain suggestions for the consideration of this thoroughly representative gathering.

It is no difficult task to sum up the present railroad situation. We can all see that something is wrong, but no useful purpose will be served unless we can suggest some constructive methods of improving railroad conditions.

Examine, for instance, the Eastern Railroads, which reach the centres of the largest population and heaviest traffic of the country, and you will find greatly diminished gross revenues and a still greater proportionate reduction in net revenues; their purchasing powers are stringently curtailed, and their credit has been greatly weakened. This condition arises from causes largely beyond their own control, so that the return earned during the past year upon the money invested in the road and equipment of these Railroads amounted to less than 4%. This serious condition is not new, but it is now acute. We have been living on hope at least since 1910, when the downward trend was clearly indicated; how much longer we can exist on that precarious asset, I will not venture to say, except to suggest that it takes more than hope, advice, or enthusiasm, or all combined, to pay wages and taxes, provide satisfactory service, pay dividends, and retain a proper credit basis to obtain capital for improvements and extensions.

Increased traffic will not cure the railroad malady, for remember that up to the present all their economies and efficiency, obtained by increased train loads, etc., have been offset by increased costs, wages and taxes. These companies therefore need not merely the very moderate increase in rates for which they petitioned the Interstate

*Address before the Chamber of Commerce Meeting, New York, Dec. 3, 1914.

Commerce Commission, but also all the revenue that can be secured by working out in practice the various other means suggested by the Commission for increasing revenue.

A full consideration of the railroad position and the effects of public regulation must not however stop there. Irrespective of any decision in the rate case now pending, whether it be finally favorable (as we trust it will be) or unfavorable, it is evident that the time is ripe for suggestions concerning constructive railroad legislation and policy.

I need not remind you that after agriculture—and what would agriculture be without railroads?—the railroads are not merely the most important industry in the country, but they are also in their essence public institutions performing functions which are by their very nature of a public character. They are owned in part by an army of individuals, actually holding their stocks and bonds, and in part by institutions such as savings banks, insurance companies, universities, hospitals and other philanthropic enterprises, in the welfare of which many more millions of individuals are vitally concerned. These are largely dependent upon income derived from the money they have invested in the service of the public, and rightfully they hold railroad managers responsible for this income. It should be the business of government regulation, not merely to see that the public is properly served by these railroad managers, but also to see that the owners of the properties are fairly compensated, and that their revenues are sufficient to properly discharge their duties to the public. Otherwise the managements of these companies will be prevented from efficiently discharging their obligations to the public and their owners. The railroads must give the public good service and their operations must be continuous in good times and in bad. Moreover, the railroads of the country pay over \$140,000,000 in taxes every year, a sum equal to 5% on nearly three billions of dollars, requiring over 16% of their net operating revenues. They pay good wages to their own employees and furnish profitable employment for the industries which furnish railroad materials and supplies.

But apparently the interests of everyone have been safeguarded under public regulation except the interests of those who furnish the money for the public service; and we must protect these investors upon whom we must rely for future capital. Failure in the last decade to protect the railroads and railroad investors has at

last produced a lack of confidence in public regulation, and we now know that through the weakness of the railroads, the whole country is suffering. Upon this great industry, through the operation of too many hastily enacted Federal and State laws, and by failure to provide and adjust the machinery necessary to enforce these laws by reasonable and practical methods, a mistaken policy of repression has been imposed, which has not permitted railroad charges to increase with the enforced increase in the cost of their operations. This has caused loss to existing railroads, and has precluded the building of new lines, and the making of needed improvements and betterments on the present roads. The inherent weakness of the present situation is that we as a people seem to have assumed that the present railroads and their equipment and facilities are complete, and are sufficient for present and future needs, and that the chief function of public regulation is to curtail their revenues, increase their expenses and lessen the margin of return. In this growing country, the present railroads are far from adequate, and therefore the policy of repression is bound to bring, if it has not brought already, a day of reckoning. Let us not forget that if we expect people to continue supplying their savings for our railroads, present and future, their earnings must continue to be what these investors regard as reasonable and sufficient, and they are not likely to be governed by the opinions of legislators, or Commissions in this respect. The present policy of repression must be modified and lack of confidence must be removed, or these millions of investors will seek other avenues to utilize their capital.

NOT A CASE FOR STERILE CRITICISM.

There are some particular features of the railroad situation, incidental to public regulation, to which I would direct attention.

The railroads are existing under conditions that breed business depressions, because of arbitrary, heavy and frequently unjustifiable burdens imposed upon them, by legislatures, State and National, and there are still many wasteful legislative experiments forthcoming unless the authors discover that the public will not willingly pay their cost. Public opinion is now convinced, I feel, that the railroads are entitled to more equitable treatment under public regulation, and that opinion and your very kind invitation have opened the way for me to offer some suggestions.

The present situation is not the result of premeditated action or of a clearly defined punitive public policy; it is the result of our

failure to fairly adjust our national conception of the rights and duties of these common carriers, and to adapt our new laws for public regulation to rapidly changing commercial and financial conditions. It is not, therefore, a case for mere sterile criticism, but for mutual study and co-operation to the end that the evils now existing may be clearly recognized and corrected. The public, the railroads and the Commissions, State and Federal, should unite in an effort to ascertain and finally establish the principles upon which wise regulation should hereafter proceed, so as to retain for the people at large the advantage of our American system of private ownership and operation under public regulation, and avoid being forced into another system far less desirable in a country such as this.

Can it reasonably be contended that any large and important business enterprise, whether individual or corporate, could be successfully conducted if, notwithstanding radically changed conditions and substantially increased costs of production, it could only increase prices subject to the power of an administrative body which on its own initiative and without a hearing might suspend the increased prices for an extended period? Under the existing Federal law, increases in railroad rates, no matter how reasonable or justifiable, may be suspended without any hearing, for at least four months after they would have become operative. In practice, this means five months after the rate schedules are filed with the Commission, and the suspension may be extended by the Commission for a further period of six months. It is, therefore, possible even if the new rates are justifiable, for the railroads to lose nearly a year of benefit from them while the Commission is determining their reasonableness. Is the public welfare promoted thereby? From practical experience and in a spirit of fairness and justice, I should say it is not, and the period of such suspension, and the determination of the question at issue, ought to be restricted to sixty days after the date of filing new rate schedules with the Commission.

Another trouble in the present situation is that the Interstate Commerce Commission has been over-burdened with work and with responsibilities, many of which must be deputed to a large corps of subordinates, so that in many instances, direct consideration by the entire Commission is impossible. The work of the Interstate Commerce Commission, as originally designed in 1887, was to prevent unjust discrimination in rates or service, to see that rates were

reasonable, to secure publicity of railroad rates and practices, prescribe uniform railroad reports, and primarily act as a referee between the public and the railroads. The Commission was given limited, but well defined, powers within reasonable scope. Now, however, as the result of new laws, the scope of its control of railroad operations and development has been largely extended. It could materially assist railroad development, but so far it has proven impossible for seven men in one centre to act not merely as regulators but as administrators of the railroads, leaving the financial results and responsibility of that administration to be borne by the Companies and their owners.

There is also a certain amount of disagreement between the Federal and State laws and orders of Commissions, and of failure to recognize the inroads on railroad revenues of new laws, orders and of Governmental awards.

Let me use just one example of the commercial chaos resulting from such conflict. The recent difference in the views of the Interstate Commerce Commission, on the one hand, and the Public Service Commission of New York, on the other, in connection with the allowances to industrial railroads, has, during the last eight months, resulted in freight values, via the lines of the New York Central (whose route is intrastate) from one of the large industries at Buffalo to New York City, and to other places on its line, lower than via any of the trunk lines, as their routes between Buffalo and New York are interstate, and there is nothing that the other railroads could do to meet this situation, injurious as it was, not only to themselves, but also to industries local to their lines. The same situation, arising from the same cause, existed in the State of Pennsylvania, as between the Pennsylvania Railroad Company and other trunk lines. These differences must be reconciled for the welfare of the public and the railroads.

SUGGESTIONS FOR HELPFUL REGULATION.

In the practice of public regulation, from the constructive side, I would at this time suggest:

FIRST.—That the Interstate Commerce Commission should be materially increased, and so organized as to be able to deal promptly with the very important railroad questions affecting all parts of this large Country, and thus conserve the time and energy of railroad officers, the public and the Commission. The additional members of the Commission should be selected from men having experience

in railroad management, operation, traffic and finance, and if men of broad business experience were also added, it would be very helpful.

SECOND.—That the position should be placed beyond political influence, by a long tenure of office, and with compensation sufficient to attract and retain men of the widest experience and greatest ability. We recognize the necessity for men of this character and technical experience in dealing with banking and other broad business enterprises, and we must recognize that equally wide experience is just as essential to deal intelligently and wisely with the railroad problems.

THIRD.—That the regulatory power of the Interstate Commerce Commission should be clearly extended to the supervision and control of all rates and practices which directly, or remotely, affect interstate transportation or commerce.

FOURTH.—That the Interstate Commerce Commission should be given the power to interfere, by appropriate action, whenever necessary to maintain a rate structure approved by, or satisfactory to, it, even though, to accomplish this, it should be necessary for the Commission to prevent reductions of rates which would have a contrary effect, or to compel advances of rates found by the Commission to be unreasonably low. An unreasonably low rate may be beneficial to some one or more shippers, but the rates of some other shippers are sure to be disadvantageously affected thereby.

FIFTH.—That for the existing repressive policy of public legislation, a constructive policy should be substituted, and existing legislation should be so modified as to permit the railroad companies to do their full share in the development of the Country's resources. It will naturally follow that the Commission should be enabled, and indeed required, in the determination of questions involving railroad rates and practices, to deal with the questions before it, not merely from the standpoint of the shipper and the carrier, but from the larger standpoint of the entire Country, and on such economic and business lines that due and controlling weight may be given to these larger interests essential to the public welfare. Such a change in public policy and legislation is requisite to encourage the investment of private capital for railroad extensions and additional facilities.

For instance, I seriously question the practical utility of railroad valuation, for I believe that very few railroads are over-capitalized, and I know the public is not required to pay higher rates

on weak roads than on the more conservatively capitalized railroad lines. Therefore, while the railroads are cordially and fully co-operating in the work of Federal valuation, yet under present conditions and when economies are being enforced everywhere, I look to the Commission, under such an equitable public policy as I have in mind, not to commit the Country and the railroads to so vast an expenditure until one System, or the lines in one section of the Country, shall first be valued and the results demonstrated to the Country.

SIXTH.—That, as another necessary result of a constructive and equitable policy towards railroads, and with a Commission amply strengthened to deal with railroad questions, Congress would no doubt refer to the Commission for investigation and report, such legislation as affected wages, employees' working hours and conditions, increased taxes, boiler inspections, extra and unnecessary men on trains, non-compensatory mail and parcel post service, railroad valuation, improved stations, grade crossing elimination, and other matters which seriously affect railway revenues and expenses. Due weight to these heavy expenditures would thus be given in approving rate schedules, and a tangible basis would be thereby provided on which to continue the regulation of these matters (if essential to the public welfare) without injustice to the railroads. The inability of the railroads to protect themselves in respect to increased wages fixed by Governmental action could not be more forcibly presented than in the November, 1913, report of the Board of Arbitrators under the Newlands Act, relating to conductors' and trainmen's wages on which your President served as Chairman.

SEVENTH.—That the extraordinary power to suspend rates without a hearing should be limited to a period not exceeding sixty days after being filed with the Commission, or some such reasonable period. If after such hearing as could readily be had within this period, coupled with the information and data already possessed by the Commission, from the current and special reports made by the railroads, under its uniform accounting regulations, the Commission could not be satisfied that the increase proposed ought not to be made, the rate should rightfully become effective, and the present confusion and delay would end. The railroads as an act of self-preservation will always endeavor to make their service and facilities satisfactory, and rates reasonable, because only in this way can they make friends, encourage business and earn profits.

In conclusion I say that considerable emphasis has been laid upon the fact that the railroad companies, and their owners, are deprived of an appeal to the Courts for the protection of what they conceive to be their just rights as against the orders of the Commission. I am willing, however, to continue relying upon public regulation and public opinion to protect the railroads, although I cannot overlook the fact that the Eastern Railroads are earning a return of less than 4% on their property investment. If this is not approaching confiscation, how much less must we earn before reaching that point? Surely the Country does not want impoverished railroads unduly restricted in the conduct of their business. What it does want is strong, aggressive lines, built and improved with private capital, efficiently managed and operated, subject to equitable public regulation.

What I have suggested may not meet all the difficulties in the public regulation of railroads. Other helpful suggestions will doubtless be forthcoming from railroad and business men and commercial bodies, etc., and, I trust, from some statesmen. There can be no difference of opinion that public regulation must be equitable so far as the railroads are concerned, and must be adjusted to promptly respond to business conditions. Such a change will encourage initiative and enterprise in railroad management and will assure investors here and abroad, that their money has the full protection of our laws and that they will be equitably dealt with.

I believe in regulation by Commission, and I urge, therefore, that we do not encourage destruction of such regulation, but rather its conservation, by adapting it, as we have banking regulation and other laws, to suit the needs of the country as they change from time to time. We must look beyond the present obstacles and view the whole subject from the statesman's standpoint. Under an enlightened policy of public regulation, but not repression, the railroads will be placed and kept in a strong position to meet increased traffic demands, as well as to live healthfully in times of depression. If we now by equitable dealing ensure their strength, one of the greatest obstacles to the recovery of financial confidence and business enterprise can be removed.

THE OUTLOOK FOR BUSINESS*

BY MR. JAMES J. HILL.

Everybody knows that business conditions in the United States are now and have been for some time, broadly speaking, very unsatisfactory. Many concerns have been shut down. Others are running on short time or with reduced forces. New enterprises are not being started. Old ones are not extended. It is a time of hesitation, of uncertainty and of discouragement. The number of unemployed is great and constantly growing. These conditions call for a calm survey of the situation without prejudice; for a review of the causes which have led or forced the country into such a position; for an inquiry into the means by which these conditions, unfavorable to every interest, bearing even more harshly on labor than on capital, may be remedied or removed.

Looking back to a period prior to 1904 when it will be admitted that the business interests of the United States were prosperous, it is not difficult to decide what influences have disturbed the situation and dimmed the outlook. In stating these I wish it to be distinctly understood that I do not mention all of them in the way of criticism. A wrong policy, a wrong act in the past, may require the application of the knife; and temporary loss may be only the price of a restoration to health and stability. The reduction of tariff duties was promised by both political parties and the fulfilment of that promise was demanded by the country. That it may prove in the long run of benefit to the very industries upon which its temporary effects would be unfavorable, could not prevent some shock from the change. There has never been a revision of the tariff without some slackening of business activity. Even if there had been no other forces at work, the wheels would have slowed down somewhat until tariff legislation had become operative and settled.

On the heels of this came the war that has disarranged the industries, the occupations and the daily life of most of the civilized world. People are inclined, however, to exaggerate the effect of the war in Europe upon the ordinary business life of the United States. We are, indeed, profoundly involved in the commotion which has deranged economic values as an earthquake does the physical face

*Address at the Annual Dinner of the Chamber of Commerce at Rochester, N. Y., Dec. 5, 1914.

of the earth. For a time the interruption of commercial interchanges and the destruction of international financial credits produced an impression of disaster greater than the fact. Some of our factories are silent, but others find themselves busy with new orders or able to enter with profit into branches of manufacture previously closed to them by foreign control of markets. The grower of cotton has suffered loss, but the grower of wheat and other cereals has gained. The business of the railroads has been greatly reduced, but still our soil products must be carried to market. And behind the obscurity of the present shines the light of a promising future. When the war ends, the working frame of all Europe, warped and ruined like the towns of Belgium and Northern France, must be reconstructed. For a time, at least, much material must be furnished by the United States. Under the spur of such a demand this country should enter upon an era of great prosperity, if it has not meantime itself made that impossible. As a prosperity destroyer, the war must yield place to a more disastrous cause which preceded it.

CAUSES OF STAGNATION.

Coming down, then, to the radical and permanent, as distinguished from the partial and temporary causes of the bad times that everybody deplures, one stands out pre-eminent by the volume of its effects and the persistence with which it has raged all over the country, though with special intensity at Washington, for some years past. This is the legislative crusade against business. I speak here of no particular act. For the business interests of the country as a whole have been under fire for more than ten years. That attack has steadily increased in violence and decreased in discrimination. The ingenuity of restless minds has taxed itself to invent new restrictions, new regulations, new punishments for guilty and innocent alike. And it is that last condition which makes the new regime so unjust and so intolerable. No voice can be raised against a fit penalty for the man or corporation that has transgressed the law, or sought to impair the settled and immemorial bases of business enterprise and business integrity. If any corporation, firm or individual has offended against the law, to punish him under the law offends nobody and awakens no criticism. In effect, that has been entirely practicable for nearly a quarter of a century, without adding one new line to the statute book. But while existing laws were allowed to fall into more or less complete disuse, new laws were heaped on one another. Each of these invaded some new territory,

laid the hand of authority on some new occupation, drew closer the circle of business interference to a bureaucracy. Innovation scarcely stopped short of declaring any marked business success *prima facie* evidence of crime. The country is feeling the inevitable effect.

When hostile regulation goes to this extent, without promise of a limit to either its objects or its orders, business would come to a halt though tariff rates were raised to the skies, and peace prevailed all over the earth. It cuts down present activity, and it also puts a veto on all expansion and extension. The present may be obscure, but the future looks black. For here industry begins to realize the indispensable need of capital, and to feel the effects that follow its withdrawal. Years ago the share of the laborer in production may have been undervalued or ignored. Now it is the fashion to overlook or deny the part of capital. And both mistakes are costly. For new plants will not be built, raw material will not be bought, wages can not be paid unless capital is ready in sufficient quantities to perform the functions that are possible to it alone. It will only do this on two conditions, both imperative. Capital desires and expects to earn at least a reasonable profit, or else it hides and refuses to work. There is no reason why it should take the risks present in even the most conservative employment unless there is a possibility of commensurate profit. That possibility, too, must have a promise of continuance sufficient to make it worth while to go into the enterprise at all.

Now it is exactly these two indispensables, the fair return and a reasonable lease of life, that continuous legislation against business has destroyed or threatens to destroy. Politicians have acted upon the theory that it is good to burn down your house because a chimney smokes. Fire has been started in many places. It remains to be seen whether the good sense of the people is not ready to call a halt. If capital is not available in quantities or on terms that the work of the country requires, business can only go from bad to worse until a new economic equilibrium is established by the force of disaster itself. But is it necessary to go through so much in order to learn something so simple?

The condition of the railroads of the country at this time is typical. They have been compelled to appeal again and again for relief from regulation that is crushing the life out of them. At one end is the constantly diminishing rate; at the other is the constantly in-

creasing expense. Most of it is compulsory, in the shape of added wages, new and costly forms of service, complicated investigations and reports required by authority, and a rising mountain of taxes, all directed by new provisions of the law. They are the most conspicuous victims of the desire for regulation. In summing up the case for the thirty-five railroad systems that appealed to the Interstate Commerce Commission for relief, here are the findings of actual facts: "The complete returns for 1914 show for the 35 systems, in round figures, an increase in total capital obligations of 159 millions of dollars; an increase in property investment of 249 millions; a decrease in operating revenues of 48 millions; an increase in taxes of 3 millions; a decrease in net operating income of 76 millions; a decrease in dividends paid of 12 millions; and a decrease in surplus over dividends of 84 millions, the surplus of nearly 76 millions in 1913 having disappeared, and a deficit of 8 millions being shown in 1914."

This was what happened under normal conditions, and it was bad enough. But since then the war has hit the railroads hard. A preliminary report of the Bureau of Railway Economics shows that in the month of August the operating income decreased three dollars per mile. And this was on top of a decrease for the preceding August of 13.6 per cent. Total operating revenue decreased 5.6 per cent as compared with the same month in 1913. And so the impairment or paralysis not only of the carriers, but necessarily of the country behind them, marches on. There is no more perfect reflector of the business condition of a country than the reports of its railroads. Their main traffic is the carriage of commodities from the seller to the buyer. Decrease commercial transactions, and the freight earnings must fall correspondingly. Just as a river's volume is the best measure of the rainfall of its watershed, so the business of a railroad is the measure and the result of conditions in the country that it serves.

All kinds of business, all industry of the country now begin to feel the heavy hand of interference that has rested on the railroads for many years. These have been made unable to obtain the capital required to keep them abreast of the work they have to do. All other enterprises suffer from the same famine. Capital, repulsed from one employment, is finding other doors shut in its face by unfriendly legislation. It justly fears that those still open may be barred and locked at an early session of congress. So it decides to

stay comfortably at home until there is some promise of better conditions. The country is now feeling the effects. There is abundance of money and credit. Never before was there so much of either in the United States. The reserves of the banks, notwithstanding war alarms and problems, show a tendency to increase the surplus over the legal limit. There is plenty of commercial money, but little investment money. In that difference speaks the whole situation.

One obstacle to obtaining sufficient capital to carry on our enterprises is the world-wide rise of interest rates. Norway is a country at peace, and likely to remain so. Its people are industrious and frugal, and its credit is deservedly high, yet Norway has just paid six per cent on a loan for two and three years. What rate will Europe have to pay when it comes to capitalize the destruction wrought by this war, and then to add the cost of reconstructing its industrial plants after peace has been declared? All these countries will be in the market as borrowers, necessarily, for years to come. To offset some of their debts they will, as soon as normal market conditions prevail, send back to us a large share of the billions of American securities held abroad. What rate will our people have to pay on new borrowings? What will happen to business as related to this new demand for capital and this higher remuneration that it will command?

Here there is no uncertainty. Capital, until it is invested, is free. The capitalist will not put his money where it brings him a lower rate of return or is subject to more risks than in another occupation or another place. The whole world will presently be bidding for his available surplus. If, under the circumstances existing just before the outbreak of the war, business was languid in the United States and industry was descending the slope of depression toward the slough of bad times, because legislation continuously attacked both the profits and the security of capital, what is likely to happen now?

Mr. Charles A. Conant has just published an inquiry into the effect of the war on the supply of investment capital and on interest rates. His main conclusions are supported by a wealth of facts that need not be repeated here. He estimates the total cost of this war conservatively at not less than \$15,000,000,000 for one year. The average amount of new capital available for investment all over the world for the last few years has been about \$4,000,000,000 per annum. This will be reduced by the inability of the French and

Belgians, the most industrious and saving of nations, to make their customary contribution to the stored capital of the world. Its savings heretofore have all been absorbed by new security issues. Yet to that demand must now be added about four times the total capacity of the world for saving in times of peace. For years to come credit will be stretched to the breaking point, and capital in greater demand than it has been within the memory of living man. Before war became imminent, a drop in the market prices of French, German and English government securities had reflected the rising rates of interest. One railroad company in this country recently put out an issue of short time notes on terms that made the cost of the loan to the company over seven per cent. As Mr. Conant says, "Even if New York banks and capitalists should refuse to subscribe for a penny of the new loans or to carry them for clients and banking correspondents abroad, they would be compelled to meet their full share of the burden imposed by the high rates for short-term money which would be reflected from other financial centers in New York, and by the very important consideration that they would be compelled to take back, through the American stock exchanges, a large part of the existing investment of European capital in American securities." The certain outlook is for a period of active demand for capital all over the world, interest rates risen to new levels, and all industry and its profits must be accommodated to this unless it will be comparatively reduced or cease entirely.

Now the most serious difficulty in meeting successfully these new business conditions is the restrictive force of laws already adopted for the regulation of business, supplemented by two present tendencies of government. These are the rage for borrowing and spending, and the constant drift toward paternalism, with its inevitable accompaniments;—decline in efficiency and increase in cost. It is plainly impossible to continue the public extravagance of our cities, states and of the national government. The increase of negotiable securities in the United States is estimated at \$1,600,000,000 per annum. The cost of government, local and general, has been figured approximately at \$3,000,000,000 per annum. Yet the annual appropriation totals continue to rise; and resort is always had to new borrowing and new taxation and not to reduced expenditure. If business is to find such terms as will bring back prosperity, the universal waste by public authorities and the tendency of many corporate bodies to make both ends meet by borrowing instead of saving must come to a speedy end.

Our progress toward a centralized paternalism is so marked and has gone so far that the middle-of-the-road Socialist has little reason to complain that his party has not already secured a majority. Under laws passed at the last session of congress, most corporate business in the United States is under direct federal control. Every year sees the transaction of business made more expensive by laws prescribing multiplied and costly reports, ordering expensive improvements or additional services, laying new taxes, compelling the engagement of additional employes and the raising of the compensation of the old. This is the history of paternalism, of centralization, since ever the words or the things were known to the world. That governing method has always been the most wasteful of all, no matter whether it hid itself under the title of monarchy, aristocracy or democracy. Under the tribute it attempts to levy, business in the United States would eventually become unable to conform to the onerous conditions of the new era.

OUR SYSTEM EXPENSIVE AND INEFFICIENT.

It would be an alleviation or some compensation if this governing system were efficient. But it is as incompetent as it is expensive. This is not the fault of any man or any party. It inheres in the method itself; and in the persistent American delusion that democracy can afford to overlook, in its selection and continual change of governing instruments, the matter of fitness. Nowhere else outside of the strictly barbarous countries is the idea that public place should presuppose some direct business qualification for it so contemptuously rejected. Industries which represent billions of capital, capital belonging largely to people of moderate means who have to live on its income, are under the orders of officials chosen for political reasons, many of whom could not earn on their merits a salary large enough to keep them alive in the service of concerns which are now at their mercy. It is not malevolence, it is not corruption, that strikes at the heart of business so dominated; it is the ignorance of well-meaning men who have been placed, for political considerations, where they do not belong; where they can do no good and may be able to do immense harm. And this is true through much of our public service. It is a master stroke of irony that while business all over this country, from the largest to the smallest concerns, has been spending time and effort and money in an endeavor to realize efficiency, and to incorporate the approved methods of efficient management with its own, the governments to which it

must render an account and whose orders it must obey remain the most striking examples of inefficiency to be found anywhere in the world.

Nations whose intelligence is no higher, whose initiative is far less, whose ideals are lower than ours are ahead of us in this respect. The people of the United States are trying experiments every day, cutting off limbs, extracting vital organs to see if they will continue to function in some new environment, playing with life and death in political hospitals, under the guidance of doctors who have not even studied anatomy, and with nurses whose idea of the best way to restore a patient's strength is to open another vein somewhere in his body and let the blood run. Paternalism and extravagance have lived in conjugal union from the time that governments began. No decree of divorce can ever be pronounced between them; and their offspring, inefficiency, is the perpetual disturber of wholesome business life.

The main outlines, then, of the present business situation are clear. This country may enter, if it will, certainly after the close of the European war, and probably much sooner, upon a period of remarkable prosperity. To it will be given the task of providing for a time for the maintenance of a considerable portion of the world's population and industry. This great and continued demand on us should be the guarantee of a corresponding prosperity. It would be so if no artificial conditions intervened. But, to realize this, both capital and business initiative must have reasonable freedom. The enormous destruction of wealth, the continuous borrowing of sums hitherto unknown even to world finance, the consequent raising of the interest rate, all foretell new and difficult conditions for American enterprise. It is less free to take advantage of them than ever before. It must operate within the circumscription assigned to it by laws which the courts will probably take twenty years to interpret. At every promising opening it sees a signboard, erected by public authority, bearing the words "No thoroughfare." If the next five years are to repeat the history of the last ten, then there can be no great business improvement and no general prosperity in the United States.

These words are not spoken in a spirit of hopelessness. The American people has an enormous fund of underlying common sense. It is fundamentally conservative, though it loves to follow the circus parade once in a while, listen to the music and applaud the

clown. And it does have constructive ability, no matter how sorry may appear some of its efforts in this direction. Since its own well-being is now definitely at stake, it is not unreasonable to hope and expect that it will take the few and simple steps necessary to the realization of its hopes. The first and indispensable requirement is a respite from attack of at least a few years for the business interests of the country. So great are its recuperative powers that probably one or two years of complete freedom from foreboding as well as from assault would accomplish great things for all industry. Subordinate for a moment the extension of the sphere of the governing power to an improvement of its quality. Ruling powers that do not give the people at least an efficient conduct of public affairs should change their methods. It is time for all the people to remember and keep on remembering that no man has a right to hold public place, from the top to the bottom, unless he has knowledge of that particular line of work.

Hand in hand with a government of self-restraint and efficiency will go economical government. The expert is always the cheapest employe. Men throw millions about because they think it comes easily from a tax on the income of the rich, and hurts nobody. No dollar is ever taken needlessly by taxation without every man in the community suffering in his degree. Just so much has been taken and spent where no productive result will ever issue from it, instead of where it will add to the resources of the whole community. The man with but one coat suffers from public extravagance just as surely as the man with ten, and usually his suffering is relatively more severe. The cutting down of unnecessary expenditures everywhere, a halt in that borrowing which has already brought many of our cities to a point where they must cripple necessary services or default on their interest charge, the substitution of repayment for refunding,—these are items of the program which would follow naturally on the introduction of efficiency into our governments. For the business men who would run the finances of private concerns as public finances are often managed are either already in the penitentiary or hopefully on the road toward it.

Rest from agitation, intelligent economy, efficiency, harmonious co-operation for business institutions as well as for political divisions,—these are not abstruse ideas. They do not provoke eloquence or attract the self-seeking. They are things as long familiar and as little revered by the mass of men as the contents of the Deca-

logue. We must go back to them or suffer the penalty paid by every creative thing that defies the law of the physical or that of the moral order of the world. The business interests of the country are anxious to do their part. Selfishness alone would impel them to co-operate in utilizing opportunities not likely to return. The men behind them have their share of patriotism, too. They have a great stake in the future progress of the country. Co-operation, mutual understanding, mutual confidence in place of distrust and enmity, are powerful means for natural growth. To us, if we have not lost the qualities that have made and kept this country as great in its citizenship as in its material resources, will belong the rewards of labor without envy and liberty with self-restraint.

The President of the United States whose life, spent in study and investigation, qualifies him as an observer of current events, has recently manifested a desire to aid the business of the country to regain some of its former vigor. If others in public life will aim to give the whole country a chance to adjust itself, and an opportunity to test the new and manifold conditions imposed by recent legislation, the whole country will, with new hope and increasing confidence, step rapidly forward toward the sunshine of commercial peace and national prosperity, greater than it has ever known.

STATE REPRESENTATION ON RAILROAD BOARDS*

BY E. P. RIPLEY.

PRESIDENT, ATCHISON, TOPEKA & SANTA FE.

You all know how fashionable it has been to acquire notoriety by abuse of the railroads. You remember Louis Brandeis, Tom Lawson, Senator Cummins and LaFollette, to say nothing of our friends Murdock and Bristow, who, knowing but little, protested much and forcibly against granting to railroads any relief. You remember that for many years the quack nostrums prescribed by such men were in favor, their misleading statistics accepted as facts, until it has now become apparent to all that the patient is seriously ill; that the patent medicines have wholly failed and that other methods must be followed.

The government has, so to speak, befouled its own nest—it has destroyed the confidence of the American investor in the securities of its own home roads. The attitude of Congress and of many of the state legislatures has been to regard the railroads as a criminal class—every statute has bristled with prohibitions and penalties and the most influential politicians have been those who could devise new means of torture for railroad stockholders and managers.

Unfortunately enough, there has been developed certain irregularities, perhaps dishonesties in the management of certain corporations, and these have been seized upon as a justification for putting a straight-jacket on the entire transportation business of the country.

I hope it is needless for me to say that I do not approve some of the methods that have been pursued, but these cases of corporate mismanagement or incompetency are the exception and not the rule. For seven years the books of the railroads have been open to the inspection of the Interstate Commerce Commission, and every facility offered to enable that body to ascertain the facts. I maintain that during the last ten years no other business has been conducted on any higher moral plane or with greater regard to economy or efficiency. To condemn all because of the shortcomings of a few is as unjust

*An address delivered before the Knife and Fork Club, Kansas City, Mo., on October 24, 1914.

as to condemn all banks because some of them are badly managed. The crowning act of injustice as well as folly is the practical disfranchisement of railroad securities as a basis for asset currency. The railroad securities of this country have been regarded as "gilt-edged"; they have been favorite investments for savings banks and insurance companies—safeguarding the savings of the thrifty of our population, and they were beginning to be popular in Europe, also. An eminent authority on financial matters says:

"The exclusion of railroad and industrial securities as bases for emergency currency was not the result of wise and patriotic law-making, but was done in response to ignorant popular clamor against railroad and big business—to spite capital."

The government passes on and approves the investments of our fiduciary institutions—it says in effect that railroad securities are good enough to secure your money and mine, but not good enough for acceptance by government as basis for issuing currency, thus putting all the world on its guard against the securities of the largest industry of the country.

In the strained conditions that prevail in Europe it is altogether likely that as soon as our exchanges are open European investors will seek to return us large quantities of our securities. Who will buy them? Why should anybody buy them, since our own Congress has said in effect that they are secondary in security to bonds of municipalities or states? If there are no buyers there will be no price. Picture to yourself the result of a flood of securities on the market and no buyers. What will be the effect on savings banks, insurance companies, colleges—all fiduciary and benevolent institutions, whose assets consist largely in railroad securities? With a shrinkage of values of unknown size, they will be practically bankrupt.

I am not an alarmist, and I do not wish to paint a gloomy view of the situation, yet I do not think I have exaggerated the crisis to which hysteria and systematic muckraking have brought us.

It would be a foolish thing to prophesy disaster and to offer no remedy or palliative. The present system cannot last. It may almost be said to have broken down already, and talk of flying to government ownership as being the only recourse is getting more and more common. But the public knows too well what the operation of the railroads by government agencies would mean—the waste, the inefficiency, the political pull. No one can point to any business

enterprise successfully and economically conducted by government, and to exchange the efficiency of present methods for those of a government bureau would be a bad bargain, indeed.

I said that no business had been well conducted by government, and I repeat it, but some people point to the post office and to the Panama canal construction as evidence that government can do things.

As to the post office, it is archaic in its methods, wasteful in its administration—such efficiency as it possesses comes mostly from the service rendered by the railroads, for which they are underpaid. I would guarantee to form a syndicate which would give a better service for less money and pay the railroads fairly at the same time.

As to Panama, the work has doubtless been done well and promptly, yet it may be permitted us to doubt if a private corporation might not have done it as well for much less money; and it should be remembered that the reason for such success as it has had lies in the fact of its entire divorcement from politics. We cannot trust Congress to keep its hands out of business matters. It interferes in our post office service, our diplomatic service, our navy and army matters and our Interstate Commerce Commission. What would the conditions be if government attempted railroad operation? I believe that there is not at present in this country any considerable sentiment in favor of government ownership in view of its probable consequences, and yet those who study conditions and who realize that the present system cannot stand have not as yet perceived any other alternative.

The proper settlement of this railroad question concerns every man, woman and child and is likely to have most important bearings on the future of the country. Shall we continue the policy of starving the railroads into inefficiency and semi-paralysis, or take them into the absolute ownership and control of government, or turn them loose to shift for themselves free of all restraint?

The first method is being tried and has gone far enough to demonstrate its impracticability; the second would, in the opinion of most of us, be disastrous. I do not favor the third, for I believe the public should be considered and should have a voice in railroad questions which concern its welfare.

The present system of so-called "regulation" is failing, if it has not failed already. Is there no relief save in government ownership and operation? Why not try at least experimentally a middle course?

Every night five magnificent trains leave Chicago at practically the same hour for Kansas City. Each train carries every modern device for the comfort of passengers and not one of them is loaded to its capacity.

Six trains leave Chicago for Omaha nightly and five for St. Paul, and of all of them the same may be said.

Probably one of these trains—certainly two of them—would amply care for all the business and a great saving would result from discontinuing the other four. This is only one instance of what could be accomplished by co-operation—which, by the way, is forbidden by law.

Every one knows that if all the roads reaching Kansas City were under one management the business could be done better and cheaper.

Suppose the government should say to each of the lines serving certain territory, we will guarantee that your net earnings for the next five years shall not be less than the average for the last five, and you shall also be guaranteed six per cent on any additions and betterments which (with our consent) may be made on the property. In return we demand one or more seats on your board and the power of absolute veto upon any act or proposed act which we consider deleterious to the community or otherwise improper.

Would not this give us all the admitted benefits of common control, all the economics incident to common ownership, and at the same time protect the rights of the public? Would it not do away with the enormous waste of the competitive system and permit the business to follow the line of least resistance, with the result of lessened expenses and probably lower rates? Who would be injured by it? Would anybody lose by it?

Suppose the establishment of railway "groups" somewhat after the manner of "Regional Reserve Banks"—each group governed by a board of directors in which the government may be fully represented. Suppose all unnecessary train service be dispensed with, all ticket and freight solicitors and their offices eliminated, with the consequent expense. Would not net earnings be at once improved and the guaranty of the government at once rendered safe? Would not the result be the immediate restoration of confidence? I do not belittle the difficulty of such an arrangement, and I realize that everything would depend on the men selected for such control.

And further, I wish it understood that the suggestion is wholly that of an individual, and that I am not making it officially. I do not know that my own board of directors would approve it, still less what view others may take of it; it is simply a possible solution of a difficult problem, and it may perhaps serve as food for thought for abler minds than mine.

To me it seems perfectly clear that the present system under which private individuals are expected to furnish the cash, while a group of lawyers at Washington provide a management out of their own theories, cannot possibly continue. Something will certainly have to be done very soon.

In the celebrated case of *Bardell vs. Pickwick* we read that one Mr. "Phunky" was intrusted with the duty of "opening the case," and the chronicler adds that when opened the "case" appeared to have very little inside of it. If it shall appear to you that the same remark would suitably apply to what I have said remember that it was your worthy secretary who procured for you the affliction.

NEEDS AND PROSPECTS OF THE RAILROADS

TOLD BY RAILROAD CHIEFS.

From the Nation's Business, official organ of the Chamber of Commerce of the United States, June 15, 1915.

So far as the need of the railroads just now is concerned, I would say: The immediate need of the railways is a larger gross revenue. This can be produced either by more traffic at present rates, or by a much higher rate on existing traffic. The first solution is dependent upon the condition of general business. The latter is a function of governmental authority. The railroads need relief from further embarrassing legislation. Regarding the immediate prospects of railroads in the United States, I think in general the probability is increasing that railway needs will be promptly appreciated by the public. Public understanding of the railway situation is becoming clearer and the public attitude more sympathetic.

J. KRUTTSCHNITT,

Chairman Executive Committee, Southern Pacific.

THEY NEED JUST TREATMENT.

What do the railroads need most just now? They need most, just now and for the future, to be correctly understood and appreciated by the people, as the most essential element in the present and future commercial prosperity of this country, and they need to have accorded to them fair, just and reasonable treatment by the public, by legislatures, commissions and other regulative bodies, in order that they may expand, develop efficient methods and improve their service. It is believed that the need is appreciated by the great majority of the principal shippers and travelers, but there are many others—and probably a majority of people,—whose daily affairs are so remote from the details of commerce that they often constitute control, without knowing or appreciating that in the end they will be vitally injured.

The railroad is the artery which carries the life blood of the nation. If it is impaired all parts of the body will suffer. As in the human body, the millions of capillaries and most remote members are those which will in the end suffer first and most. American railroads, like the American pioneers, have been the most potent factor in advancing civilization and promoting commerce in the history of the world.

Unfortunately much legislation, although doubtless enacted in good faith, has been enacted without a detailed knowledge of the situation, or without accepting the advice or suggestions of experts, or even of the Government's own commissions. Such legislation, of course, impairs efficiency, demoralizes discipline and imposes unnecessary expenses both upon the public and upon the railroads, without benefits to either. So-called "Full Crew Bills" and many similar regulations are unfortunate waste of money. This is not intended as a criticism of the need of regulation. What we appear to need is regulation based upon intimate knowledge of the problems of commerce and intimate knowledge of the great problem of railroad transportation, and proper co-ordination of the various regulating bodies.

What are the prospects, as I see them? If this refers solely to the immediate commercial outlook, it is a most difficult question to answer, because the commerce of the world is now being affected by great foreign catastrophies beyond the scope of human prediction.

Viewed purely from the standpoint of our nation, our situation appears to be most fortunate. We are at peace, with prospects of continuing so. The harvests promise to be abundant and more than sufficient to provide for all our needs. In spite of the foreign situation, which somewhat embarrasses our trade, our home business appears to be active with indications of constant growth. From a purely railroad standpoint, the prospects will be determined largely by the attitude of the public toward railroads, with respect to the eliminating of legislation and regulations which are unremunerative to the stockholders and also eliminating regulations which are not beneficial to the public as a whole.

A. H. SMITH,

President, The New York Central.

MORE TRAFFIC AND LESS REGULATION.

Answering your questions, I would say that, in my opinion, the railroads of the United States need just now more than anything else, increased traffic and less regulation. Until such traffic is forthcoming, there will be, I fear, small improvement in existing conditions, although the harvesting of a good crop such as now seems in prospect, will undoubtedly help much.

F. D. UNDERWOOD,

President, The Erie Railroad.

COMMERCE AND RAILROADS*

BY HON. OSCAR UNDERWOOD.

No great economic question is settled finally until it is settled right. To consider and decide the problems that confront the railroad world today, we must lay aside passion and prejudice, greed and desire, personal interest and political bias and approach the solution of the problem from a judicial point of view, as seekers after the truth, with a determination to stand only for the right.

Let us not forget that the money invested in our railroads exceed the public debts of the four greatest nations of the world. That from the standpoint of capital, the question presents itself as an investment of money.

Let us not forget that trade regards the railroads as its best customers, that the output of thousands of mines, furnaces, factories, are required each year to supply the consumptive capacity of the great railroad systems of the United States.

Let us not forget that labor recognizes that the railroads employ a million and a half of men and pay a wage that approximates that of the embattled armies of Europe.

Let us not forget that in the end the public either as passengers or shippers must pay every dollar that is required to maintain and operate the great transportation system of our country.

Have I defined the points of view from which the solution of the problem that confronts us must be approached? Not yet. As the human body in all its beauty and strength must fall and die when the heart ceases to drive its life blood to the extremities, so, too, will invested capital perish, trade languish, and labor starve when the great railroad systems of our country fail to perform the function for which they were created, and economically and efficiently transport the products of our fields and our factories to the ultimate marts of trade where they may find ready sale and rapid consumption.

Finally let us not forget that commerce is the vital part of a healthy business development and that an efficient transportation system is as necessary to the life of commerce as the heart is to the life of the human body.

*Speech delivered before the Sphinx Club in New York City, March 9, 1915.

IMPORTANCE OF THE RAILWAYS.

The railroads are the country's most important highways. Destroy the railroads as they exist today and you destroy our commerce and bring disaster to our people. Without their proper maintenance they will soon cease to exist. Unless you extend and enlarge our present transportation facilities the business development of our country must stop where it is today.

We have undertaken the problem of governmental regulation of railroads and the government will not turn back. Regulation of practices and rates is here and here to stay.

But let us stand for wise and just regulation and not for ill-considered and dangerous regulation. We must regulate so as to ensure all necessary railroad facilities both for the present and for the future.

As the public in the end must pay the bill, they are primarily interested in the railroads securing the money needed for their maintenance and development at reasonable rates, and equally interested in seeing that it is wisely expended.

That no unnecessary highways are built in the future and those that are selected for extension and development are best adapted to carry commerce with the least burden are governmental problems of the first importance, for it must be remembered that when you construct two highways where one can render the service required, the public in the end will bear the burden of the cost of the additional highway without receiving a commensurate benefit in return, for rates no longer will be fixed by competition, now that governmental regulation has become the fixed policy of our people.

To regulate the freight and passenger rates of the railroads so that the rates may be both just to the invested capital and at the same time reasonable to the public is a secondary problem but of scarcely less importance than the one I have mentioned first. Together they embrace the alpha and omega of the railroad problem of our day.

In the solution of these problems we must protect the rights of private property invested in the railroads and at the same time assure to the public fair and reasonable treatment in the movement of commerce of our country.

REGULATION A FIXED POLICY.

I have said the fixed policy of our people was regulation by the government of our railroad systems, and it is, for whether you

agree with me or not, you may as well accept my conclusion. Revolutions never move backward. If governmental regulation is unable to solve the vexed problems that confront us, the people will accept government ownership of railroads as the next step ahead. It is, therefore, a matter of great importance that we should earnestly endeavor to reach a fair and reasonable solution of the problem of regulation at as early a day as is possible.

The transportation problem is so closely interwoven into the business fabric of our people that governmental control in some way was inevitable from the beginning. In almost all countries the railroad question is one of first importance and has been met in foreign lands either by government regulation or ownership, but in other countries the problem has not been as difficult of solution as in our own, due primarily to two causes: Our large population and vast natural resources located far inland and at great distances from water transportation makes railroad carriage indispensable; and industrial freedom could be guaranteed only by just regulation.

Another difficulty that hinders the solution of the problem here and is not met abroad is a political one. Our dual system of government greatly increases the difficulties and uncertainties that surround the problem before us. Our Federal Government and forty-eight state governments constitute the forty-nine masters that the railroads must obey. It has been said, "No man can serve two masters." All the important railroads run through two or more states and are subject to different laws, rules and regulations whenever a train crosses a state line.

It is true that our lawmakers and our judges have endeavored to differentiate between interstate and intrastate business, but the effort to do so has led to much confusion and to much litigation. In the passenger coach we find an interstate riding beside an intrastate passenger and in the baggage car a package that will reach its destination within the state in which it was shipped resting against a parcel whose destination is across the state line. Consider for a moment that the one package is subject to the rule of one, and the other must obey the mandate of at least three masters.

The difficulties that confront us do not end here. If a uniform system of regulation were adopted by the Federal and all the State governments you would not have solved all the difficulties of regulation and control because the railroads are privately owned and our courts have held inviolable the right of the railroads to charge rates that will produce a reasonable income on the invested capital.

RULE WORKS ONE WAY ONLY.

If the corporation is successful in earning more than an adequate income the rates may be regulated, but if the revenue received is not a fair return on its invested capital the government is powerless to act.

Low rates and adequate facilities are demanded by the public, but the granting of one is often the denial of the other. Adequate facilities very often require the expenditure of large sums of money. Low rates prevent the accumulation of surplus capital and lessen the borrowing power of the roads. The price of new facilities must always be the acquisition of new capital from some source. Without new railroad facilities our commerce cannot expand beyond our present limitations and trade has met a permanent barrier to its future development.

It is, therefore, the public and not the stockholder who must suffer most if our regulation policies are inadequate to meet conditions fairly, broadly and safely; for the travelers and shippers must defray the cost of transportation and pay for incompetence in building, operating and regulating. The tax paid by our people for freight and passenger transportation for the year 1912 amounted to \$2,826,-917,967 and the part of the gross receipts that went to the stockholders as dividends was \$346,805,582,* or twelve cents out of every dollar. In fact eighty-eight cents of every dollar paid by the public went for operating expenses, taxes, and interest, before there was a cent for new facilities or dividends.

The matter of dividends today is a very small part of the equation we must solve. The public must be interested in the items that make up the operating expenses of the railroads if it desires both adequate facilities and reasonable rates.

For more than four decades the Federal government and the States have enacted laws supervising the practices and regulating the rates of the railroads, and it cannot be denied that much good and some harm has resulted to the public.

In the beginning the railroads denied the right of any government to control what they were pleased to call their private property, but they overlooked the fact that the grant given them was to maintain a public highway in which the public was as much interested,

*Actually \$210,180,802 or eight cents out of every dollar. Mr. Underwood's figures include all the duplications attending intercorporate ownership of railway securities.

if not more so, than their stockholders. Step by step governmental regulation has advanced until today railroad corporations are controlled by the public in respect to every detail of their business, and this control has been accepted and recognized by their managers.

It cannot be denied that public control has reduced the rates charged for transportation, and abolished unjust discriminations given to favored shippers. No one now contends that localities as well as shippers, should not be treated with equal fairness.

But the greater problem remains unsolved. Can the money be provided to expand and develop these great public works in a manner commensurate with the expanding needs of our commerce under the present systems of public control.

For a time the growth of population on new lines, and increased motive power for train service on old lines, enabled the management to provide new facilities and at the same time reduce rates, but the limit to development along these lines seems to have been reached.

MONEY FOR DEVELOPMENT NEEDED.

In recent years accumulated surplus of railroads have largely disappeared; dividends have been greatly reduced and the ability to secure long-time loans at low rates of interest has passed away. Without cheap money for development, new facilities cannot be obtained and low rates for transportation be maintained.

We must all give credit to the present system of regulation for the accomplishment of much good in the interest of the public, but those who are giving careful study to the railroad problems that confront us are bound to admit that our present system of regulation is breaking down; in so far as it has supervised the finances of our railroad systems with a view to allowing them to properly protect their securities that their credit may be maintained to aid in present and future development.

If railway investments cannot be made attractive to capital, is not the nation threatened with an inevitable breakdown of its transportation systems?

We can never have permanent prosperity in the country until our great problem of transportation is settled and settled wisely. There is no more difficult problem awaiting its solution ahead of us and no more inviting field for the exercise of true statesmanship has ever faced our public men.

The problem can be solved and will be worked out satisfactorily to both the investor and the shipper but it can be solved only by

wise, fearless and patriotic men, in the daylight of publicity, with the determination to do exact and even-handed justice between invested capital and the public.

Let us concede without cavil that transportation and commerce can only advance when they go hand in hand. Let us inspire courage and give aid to those leaders, who not by chance but through merit direct our industry, control our trade and manage our finance. It is not enough for our government to permit those men to rise from the prostration which has overtaken them and their affairs. It must occasionally assist them. We have reached the point on our way to social betterment where sound progressivism must recognize that the proper regulation of business requires that it must be sometimes helped, and not always hindered; must be sometimes assisted and not forever stricken; that we must occasionally say, "you may," and not always, "you shall not."

It is gratifying to know that the policies mentioned are responsive to natural growths and can be achieved without entrenching privilege and subsidizing trade. We need only to permit railways, traders and bankers that economic freedom which is consistent with a wise and helpful regulation of all affairs and to give to every citizen the national protection to which he is entitled wherever he may rightfully be—at home or abroad—for our trade to gain its lost position and our flag to be seen on every sea.

RATE INCREASE VITAL TO ROADS*

BY CHARLES FRANCIS ADAMS.

EX RAILWAY COMMISSIONER (MASS.), EX PRESIDENT UNION
PACIFIC (1884), AUTHOR "RAILROADS, THEIR ORIGIN
AND PROBLEMS," ETC.

South Lincoln, Mass., Oct. 24, 1914.

My Dear Mr. President—You will excuse my troubling you with a somewhat lengthy screed; but the topic I have in mind to deal with is important, and, for reasons which will at once suggest themselves, I feel something in the nature of a "call" to express myself thereon. You need give to what I write such amount of consideration only as it may seem to you to deserve, either consigning it to the files, or referring it to the Interstate Commerce Commission. For personal reasons, unnecessary to dwell on, I do not care to appear in person before that body; and so doing necessarily involve on my part a responsibility for statements made, imply perhaps on my part an amount of investigation for which I have not time. I see also no compensating advantages, public or private, likely to ensue therefore. I cannot afford to get myself involved in either an inquiry or a controversy.

As I believe you are aware, in earlier life I devoted myself for twenty years to matters connected with railroad development and management. I did service, both as public official and as the head of a great railroad company. Although this experience terminated in 1890, and I have given little or no study to what has since taken place in railroad development, yet, as a member of the community, I now feel so impressed with the extremely critical condition of affairs and the significance, so far as public interests are concerned, of what is now going on in my immediate field of observation, that, as I have said, I feel moved to submit certain conclusions.

In doing so, I wish to premise I do not propose to go into details, to use exact figures, or to fortify what I have to submit by statistics or an attempt at argument. I shall deal only with generalities and conclusions, perhaps merely impressions; and that tersely.

*Letter to President Wilson Oct. 24, 1914. This was one of the last public utterances of this clear headed and disinterested student of American railway affairs. He died March 20, 1915. in his 80th year.

A DANGER LITTLE REALIZED.

Forty years ago I had much to do with the origin and early development of the Railroad Commission. A pioneer, I am free now to say I had little realizing sense of what was finally to result from the movement then initiated; nor has the course of development altogether commended itself to my judgment. In connection with our form of government I still question in many respects its wisdom or its practical results.

However, what now leads to the writing of this letter is the conviction I am under that the present situation is not fully appreciated, and the elements of danger involved in it are far more considerable than is commonly supposed. As that problem presents itself to my mind, I see, moreover, no effort, at once intelligent and comprehensive, made to deal with it.

Confining myself to the situation as it comes under my daily personal observation in Eastern Massachusetts—though I am satisfied the conditions prevailing here are general—I am unable to escape the conclusion that so far as our transportation machinery is concerned we are rapidly falling behindhand, and getting also into a well-nigh inextricable snarl. The situation, too, while most portentous—for it is basic so far as prosperity is concerned—does not admit of solution except through treatment both drastic and comprehensive.

Let me come at once to the point: I am satisfied that here within, we will say, fifty miles of Boston, there is an immediate call for a capitalized railroad expenditure, fresh money outlay, of at least \$100,000,000. Nor, comparatively speaking, is this outlay excessive; for in New York City alone within the last ten years, two railroad companies have spent, or are now spending, in the neighborhood of \$300,000,000. This outlay was, moreover, required; nor is there any allegation that it has been wastefully made. Had it not been made, it would not now, under existing conditions, be possible; fortunately, it has been made, and is secure. *That* we have.

FINANCIALLY CRIPPLED.

In Eastern New England it is not, therefore, a question of dividends or interest on existing investment, or of a restoration of credit in this respect. It far exceeds those limitations; for to bring our railroad system up to the proper standard, including a renewal and replacement of rolling stock, the reconstruction of permanent ways

and bridges, the separation of grades, and the development of proper terminal facilities, and connections necessary to modern competitive conditions would, on a rough estimate, unquestionably call for the amount of fresh money above named—\$100,000,000. Moreover, unless that investment is made Eastern New England cannot maintain itself industrially. Is the fact generally appreciated that the case thus involves not merely rehabilitation but a costly development essential to continued prosperity?

Meanwhile, from causes unnecessary to enter upon, the corporations owning and managing the railroads in Eastern Massachusetts cannot remunerate the capital already invested, much less secure fresh money. They are financially crippled. This is a matter of common knowledge.

Such a state of affairs calls indisputably for prompt remedial action. The existing position is also from a common sense, business point of view impossible of long continuance. I have not time to argue the matter or to enter into details. I will merely state the fact. Here is the largest investment and active business management of the country, and those managing it control neither outgo nor income. They are told what they must do and pay, and have no voice in what they are to charge. Such a situation is economically unheard of, absurd. It needs only to be stated. It is financially impossible of long continuance.

I next find myself further forced to the conclusion that the railroad system generally has outgrown local lines, and that it is futile to expect any adequate remedial action through State legislation or control, partial or complete. The State machinery is, as respects large-scale transportation, antiquated. To indulge then even in an expectation that the problem can or will be dealt with in any comprehensive and constructive spirit through local legislation is, I submit, futile—so futile, indeed, as to be little better than puerile. This we may regret and deplore. I certainly both regret and deplore it; but the fact remains.

NATIONAL INCORPORATION.

Moreover, as recent scandalous disclosures show, the effort to flounder along and accomplish results under existing conditions lead inevitably to indirect action and consequent legislative and other corruption—what are known as “deals.” Glaring instances of this are fresh in public memory. Yet they are mere incidents of an outgrown system, inevitable as they are morally and politically destructive. They simply cannot continue.

The remedy is obvious, even if accepted reluctantly and with apprehension. It must be sought in a system of national incorporation; and, in so far as it is required, in national supervision. Every day thoughtful consideration of this grave fact is deferred is just so much time lost, and time lost in a condition of affairs rapidly growing worse. The difficulty and consequent cost of ultimate rehabilitation is enhanced.

I do not propose here to enter into the question of public ownership and management, whether State or National. Under our system of government, personally, in whatever form attempted, I do not believe it can result satisfactorily. I am certain that under State control and authority it is simply out of the question. Its consideration is a delusion, and a mischievous one, indicating incapacity and failure to size a situation.

This, however, though it cannot be lost sight of, is remote. It involves considerations, financial, political, and social, only to be dealt with as a result of long debate. What is needed immediately is manifest—a restoration of financial standing. Unless the existing situation is rapidly to grow worse, and that to an extent involving safety as well as prosperity, fresh capital on a large scale must be forthcoming.

If I am correct in all this—and daily observation confirms it—the conclusion would seem to be irresistible. The delusive idea prevails that the existing railroad managements being inefficient and extravagant as well as corrupt, only economy and good business judgment are required to produce all desirable results. Personally I have no financial interest in railroad securities. Watching the course of events and legislation, I long since ceased to feel confidence in them. While the demands for increased compensation of labor and improved facilities have been incessant, and almost uniformly complied with, the call for fresh money absolutely necessary to the conduct of the business or to meet requirements imposed by government authority has been quite as insistent and even more pressing. Meanwhile engineering and other constructive changes necessary for the convenience and safety of the public have been to a large extent at a standstill, and, under existing conditions, cannot receive attention. The necessary capital is not forthcoming. How could it be expected to come forward? The situation is unbusinesslike, illogical, and absurd, as well as impossible.

RATES NOT REMUNERATIVE.

Under these circumstances, personal experience advises me that the railroads are called upon to do business at less than remunerative rates; and to such a degree is this the case that I have had frequent occasion to remonstrate with traffic managers, both travel and freight, at receiving from them service at a price less than cost. That, taken as a whole, the railroad business pays, and shows a profit, goes without saying. Were it otherwise, it would stop. On the other hand, I am clear in my conviction that an inquiry by any reasonable, intelligent and judicially minded tribunal would develop the fact that the return on traffic received today is, as a whole, not sufficient fairly to remunerate the capital already invested—far less, in the case of the Eastern New England System, to pay interest on the hundred million additional capital indisputably required for immediate development.

From this situation, I further admit, there is one possible escape only. The community in its own interest, and in order that it may not find itself put out of business and in physical jeopardy, must submit to pay for the service it requires what the service required is reasonably worth. This, today, it is not doing.

It is equally delusive, to say that in the past, and the recent past, there have been scandals and glaring abuses connected with our railroad management. I would like to know of any business management on earth, public or private, large or small, where instances of abuse and misdoing do not occur and could not be unearthed. We all know such is the case; nor will it ever cease to be the case. When, however, such a condition of affairs as now exists forces itself on the attention there is, I submit, but one way to deal with it. Irrespective of the past or of stories of mismanagement and misdoing, whether well or ill-founded, it must be dealt with in accordance with actualities. A fresh start must be made, and, in the present case that start can only be made from the basis of proper and adequate remuneration for services rendered and construction called for. Otherwise, the result is inevitable, and that result spells widespread disaster.

This letter has already run to a length I had not anticipated. The conclusion, however, as it rests in my mind, hardly needs to be set forth. The existing situation, impossible of continuance, involves danger—danger as respects both the safety and prosperity of the community. To remedy it locally calls for the command and output

of a large amount of fresh capital—a hundred millions. On the present basis of remuneration for services rendered that capital cannot be obtained. It will not be forthcoming. Rates, meanwhile, are unreasonably low. We all know it. We all equally know that an increase of charges for public service is never popular, much less favored politically. Nevertheless, there is, I further and finally submit, no escape from it in the present case, and to palter with the situation simply implies delay, continued stagnation, and ultimate irremediable disaster.

“BURNED AT BOTH ENDS.”

Whether, therefore, obtained through Government action or through corporate management, directly or indirectly, the service required must be secured, and to be secured must be adequately remunerated. It may be, in this matter, the community will like to be cheated, or insist on somehow deceiving itself, meeting indirectly an outlay much larger than that from which it recoils when directly imposed. This however, I submit, will be mere self-delusion; and the one party always most dangerous to deceive is one's self. Yet the inclination thereto is politically well-nigh both universal and irresistible.

The conclusion to which I have now found myself forced is, therefore, manifest and inescapable. The railroad candle has, so to speak, for some time past now been “burned at both ends.” Expenses, especially for labor, equipment and construction, have increased and are still increasing; rates meanwhile have tended steadily to reduction. The calls for new development and improvements of a permanent character and most costly nature have been and now are imperative, incessant. From such a situation there is but one escape—if the community wishes safety and convenience, with a system of transportation equal to the demands and standard of the times, it must make up its mind to pay therefor; nor is the increased remuneration requisite in any respect inordinate. For Eastern New England the improved service would more than justify the increase of cost. Moreover, we must have it.

Excuse the length of this communication, but to deal with our entire railroad situation even in a most condensed fashion does require space. Believe me, Mr. President, Most respectfully, etc.

Charles Francis Adams,
To the President, Woodrow Wilson.

AN EX-RAILWAY COMMISSIONER ON PASSENGER RATES*

BY C. V. McADAMS,

EX-MEMBER OF THE RAILROAD COMMISSION OF INDIANA.

I am not in the habit of carding the press or airing my views in public. I hold no brief for the railroads. I was never and am not now employed by any railroad. I am under no obligations to them nor they to me. I spent three years in the State's service (at too low rates) trying to do my duty as a Railroad Commissioner, not only to the State, but to the railroads. Most of these three years was devoted to rates and rate conditions. During this time I came to some definite conclusions about passenger rates on steam railroads in this State. Time has not changed, but has more deeply impressed the conclusions at which I had then arrived. I think I should now speak and I do so with the same sense of responsibility that I was then under, although I voluntarily quit the State's service.

First, I am thoroughly convinced that the passenger rates on steam railroads should be increased by some reasonable and appropriate legislation. Second, that they should not be increased in the manner and method pursued in the 2-cent fare act of 1907.

The reasons justifying increased rates are numerous, well founded, and for many of them the public, who must pay the increase, is directly responsible. Almost all the recent improvements forced upon the railways by State legislation came about from a consideration of the passenger traffic as viewed by the public. Each collision or other accident tends to arouse the public, and this is so because they look to the safety of the public when traveling. The public, generally, does not concern itself greatly about the safety of train crews or their movement, other than as it affects passenger traffic.

The public, therefore, has, and justly so, demanded greater safety, and this demand has been met and is being met by the railroads, part voluntarily in response to the public demand, and part in response to legislation enacted at the demand of the public. These things, in part, are: (a) Steel coaches which cost more than double the cost of the old wooden coaches; (b) automatic block, which costs many thousands of dollars a mile, and when our law is fully complied with the lines in this State will be better protected, as I am advised, than in any State in the Union; (c) increased train

*Letter to the Indianapolis News Jan. 1, 1915.

crews, for the purpose of having a flagman on the rear car to protect the train from collision; (d) hours of service law, limiting the time which a train crew shall work without rest; (e) elimination of grade crossings by action of the Public Service Commission (this law is not yet in full operation, but it will be and is a very necessary and salutary one and will cost the railroads hundreds of thousands of dollars); (f) the installation of watchmen, crossing bills, and other crossing protection forced on the railroads by law and the action of the Commission; (g) electric locomotive headlights on every engine, required in no other State in the Union, but forced upon the roads in Indiana as a matter of safety, and properly so, but at an enormous cost in installation and maintenance.

These things have all come to pass in the last ten years, and during that time the rates were reduced notwithstanding these additional burdens. In addition to these added expenses, during the same time economic changes and the action of labor bodies have added other burdens, namely, the wages of all railway employes have been greatly increased, and the cost of railway equipment has also largely increased and there has been a tremendous advance in the cost of the millions of dollars' worth of materials which the railroads must buy annually to maintain their ways and structures in a safe and usable condition. These latter, increased costs of labor, equipment and supplies, are the direct result of economic changes which have affected all the industrial and producing life of the country during this period.

Now, look at the other side of the proposition. While these added burdens have come about by law, the demands of the public and irresistible economic changes, what has been the condition of the railroads? They have been tied hand and foot by a flat legislative rate which they were compelled to observe or go to law. They have had no freedom of action like the labor unions, the merchant, the manufacturer, the car and locomotive builders who could and have raised their prices to meet economic changes. Does the public think this is fair? I most certainly do not. It is my candid opinion that no railway, or very few at least, in Indiana, has made any money on its passenger traffic in the last eight years while operating under this 2-cent flat fare law.

This is unjust. A railroad is entitled to a fair profit upon the property it uses for the public service and, besides the profit, it is entitled to an income sufficient to provide for depreciation, renewals

of obsolete apparatus and to pay the expenses of doing the business, which includes operation and the maintenance of its properties.

Although I aided in drafting the 2-cent fare law now in effect, I can truthfully say that, in my judgment, as I now and for years have seen things, a more crude, inelastic and unsuitable piece of legislation was never enacted. It was a misfit from the start. The passenger service of a railroad is indicative, so to speak, of the aristocracy of the line, while its freight service is the barometer whereby you determine its efficiency as a railroad and its capacity as a dividend payer to the people who own it.

What would you think of the judgment of a stockman who would enter the stock pens and buy cattle or hogs at so much a head, regardless of size, age or weight? Yet he would be exercising the same kind of economic sense as the oncoming legislature will if it enacts a flat passenger rate to regulate passenger fares on all the lines and on all the trains in Indiana. Of course, a mile on one line is no longer than a mile on some other line. Neither is a hog or a steer any less a hog or a steer if it be one or three years old, big or little, fat or thin.

The railroad business is unlike an individual or private business. The farmer, merchant or manufacturer stops, slows down and starts his business as conditions may require or as his fancy may dictate. The railroad runs upon schedule and it is supposed to be on time. It is a public business and is compelled to operate. It can not quit. The Commission and the courts will make it operate. The nightmare of the railroad manager is the empty car that must move without freight, the passenger train that is scheduled and must go regardless of whether there be many, few or no passengers. The merchant does not wear out his truck unloaded on the street, nor does the farmer take his mules and farm wagon and go to market and return empty both ways. These people go when they have a load; the railroad goes on forever, load or no load.

The measure of a railroad's opportunity is the density of its available traffic. The measure of its responsibility is an efficient service to move that traffic. The efficient service is due to all communities and on all the lines. It can be and is enforced by law. The density of the traffic is controlled by the State's development. It can not be added to nor taken from by law or the action of the Commission. If the road operating in a sparsely settled country has been an efficient service and is given an income upon its property, the same as a like efficient road operating in a densely settled com-

munity, then there must be a different rate adjustment on these two lines and these two communities. Nothing in economics can be more simple and plain than this proposition.

The trunk lines operating between the large cities and through densely populated areas of the State, rich in agriculture and industry, have, of necessity, a large passenger business, while the spur and branch lines, feeding these trunk lines, and the short roads, operating in sparsely settled countries and in poorer districts, have but a small passenger business. The true test is the passenger miles per passenger train mile and the passenger miles per mile of line.

If the annual reports of the roads do not furnish this information, the Commission should demand it at once and tabulate it for the use of the assembly and for the information of the public. There should also be included in this information the expense of operation of the passenger trains per train mile, and the system should not be reported as a whole but the main lines, spurs and branches separately. These figures, if accurately made, will reveal the crudity of a flat passenger rate in this State.

Another thing about this difference in conditions which should be guarded against and that is this, legislation of this sort is looked after by the trunk lines. Their representatives, generally, are the only ones on the scene of action. The small lines trust to them. It will not do in this case. What would be just to the trunk lines would be an outrage on the small, short and newer lines. They should assert their rights and the Commission and the assembly should protect them.

The railroads many years ago did things that don't look well in print. They were manipulated for the private gain of the officers and to help their especial friends over the line. That day has passed in Indiana. They are now under absolute control and are managed by a class of honorable and conscientious men who are doing their best, under distressing conditions, to weather the business depression, preserve their properties and perform the public service. It is suicidal to badger or buffet them about. The railroad interests in the State constitute its greatest enterprise which is controlled by legislation. Their every act is subject to the control of the Public Service Commission, a body created by law and constituted of able, honest and hard working men in whom the public and the working men in whom the public and the railroads have confidence.

In view of these conditions, the Assembly, without a dissenting vote, should enact a law permitting an increased passenger rate

on steam lines in Indiana. This law, however, should provide that after a petition is filed, notice given and a hearing had the Public Service Commission should have authority to authorize rates in advance of those created by the act. Such a law would be in keeping with the law of the Federal government and the State which regulates the freight rate business, which is of vastly greater volume and importance, and such laws have proven effective and are satisfactory.

Under such a law the short and poorly patronized line can have a remedy to meet its situation and if times again become prosperous and business grows and people travel the public can also go before the Commission and ask to have the trunk line rates reduced. All that has ever been said in favor of a tariff commission can be truthfully said in favor of such a law. It should be elastic and subject to changes to meet different situations and changing conditions.

Another view of the passenger service is worthy of consideration. There is a continuous demand for a finer, safer and better equipment; a more speedy service, with fewer stops; Pullman cars, electric lights, diners, observation cars, barber shops, bathrooms, drawing rooms, valets and servants. This demand is being met. Mobile hotels dart across the State in a stream of light at aeroplane speed on a non-stop schedule. The people who demand this service should be and are willing to pay for it. It can not in reason be furnished for all the business of the line. It has come to meet a demand. The demand should respond to the service. I can see no reason why authority should not be given by the Commission to operate an excess fare train or trains on any of the trunk lines where conditions and the service warrant it.

It is a rule of commerce and business the world over to pay in accordance with what you get. The hotel, the restaurant, the merchant, the doctor, the lawyer, the barber and candlestick maker all charge you for what you get in merchandise or accommodation or service—why not the railroad? Those who demand should pay for the extra service. There is as much difference between the palace car in the high speed, non-stop train, and the common, everyday coach in the slow speed, every stop, local or mixed train, as there is between the old-fashioned inn and the modern hotel, or the faunting car and the limousine, but now most of us take the hotel and the auto at the higher price for the better and quicker service.

I should make the public pay extra for what it demands in the shape of excess speed, non-stop trains, elegant equipment and high

cost modern refinements. He who works the Twentieth Century Limited must have the twentieth century price or take a slower train; then why not make him who jaunts with the White City Special be white with the Railroad? Why not make him who joy rides on the Royal Palm come along with the revenue to pay for it? Why not make him who glides with the Hoosier limited put up something for the elegance, comfort and speed of his journey? Why not bring the Twenty-four-hour St. Louiser across with something to make him remember that he has been safely, elegantly and speedily carried from Terre Haute to Richmond? Why should the Continental limited speeder object to a limited charge for his limited ride? Why should the Knickerbocker knock on being held up for extras when he gets on much more than if he went on the mixed train from Indianapolis to Union City?

Yet all these folks travel at the same price under our senseless law and regulations as the man pays who bumps and bangs from Attica to Covington and he who is jerked into Corydon on the B. & O., or he who rides the chute-the-chutes on a hundred different spur and branch lines in this good State.

There is no sense or justice in it, and it should be stopped.

THE PASSENGER FARE QUESTION IN OHIO*

BY L. E. JOHNSON,

PRESIDENT, NORFOLK & WESTERN.

I come to you, not as a stranger, but as a friend and neighbor, to ask your aid and influence, not in order that your railway properties may show increased profits, but that the efficient passenger service furnished to the citizens of Ohio shall be at least self-supporting, and shall pay to the carriers within the borders of your state its fair proportion of the expenses of operating the railroads of your state. The railroad companies, as Justice Hughes pointed out in a decision of March 8, 1915, declaring that a two-cent maximum passenger rate law of West Virginia was unconstitutional, should not be "forced to carry passengers, if not at or below cost, with a merely nominal reward considering the volume of the traffic affected." If by such laws the revenue from the passenger service is thus unfairly reduced, the result inevitably must be that the traveling public will finally suffer in decreased efficiency of service.

The development of your railway properties under private ownership and by private initiative, in co-operation with the various fields of human endeavor, has been responsible for great material development and prosperity in all activities, and I cannot feel that our citizens, when the matter has been frankly placed before them, will sanction, for political or other reasons, legislation prescribing a rate for the carrying of passengers that does not pay to the carriers a reasonable return for the services rendered, and in so doing prevent a continuance of further development, not only in the sections which are now served by railway companies, but also in areas of undeveloped territory.

The progressiveness, initiative, and resourcefulness of the people of our country can be illustrated by the fact that, with a population of 100,000,000, we have under private investment and management about 250,000 miles of railway; while all Europe with 450,000,000 population (about four and one-half times as many) has 213,000 railway miles, principally state-owned. In Europe there are 5.7 miles of railway line per 100 square miles of area, and in the United States over 8 miles of railway for the same area. With us there is a mile of railway for each 400 inhabitants, and in Europe there is a

*From an address before the City Club of Cleveland, Ohio, March 18, 1915.

mile for about 2,100 inhabitants. If the European ratio to population prevailed in this country, we would have less than 48,000 miles, instead of nearly 250,000.

Our mileage has grown because of the prevision of the men who projected it, and invested in the securities of your railway properties. These securities are held, broadly speaking, by the American people. The integrity of every life insurance policy, the proceeds of which we may hope to leave to those dependent upon us, rests in great measure upon the integrity of your railway property. To permit the value of this property to be depreciated will affect intimately the value of your life insurance policies, and nearly every other form of investment. These values will of necessity be seriously affected unless your railway properties are permitted to earn a fair return upon the monies devoted to the service of the public, and I believe that the American people will demand that this fair return be permitted to be earned, when they understand the situation of the railway companies, and feel that the matter is being fairly laid before them.

Prior to March 10, 1906, the passenger fares in the state of Ohio were lawfully based upon a rate of three cents per mile, and by legislative enactment of that date the rate per mile was reduced to two cents, a reduction of 33 1-3 per cent. Under this act the receipts from the passenger service are not only insufficient to provide a reasonable return upon the investment, but in reality cause the carriers to operate their passenger service at a loss.

That the service has been well performed, though at a loss, is evident by the reports of your commission, which show that millions of passengers have been safely carried, and that few have been injured while under the care of the railway companies. Travel upon railway trains, privately operated, is far safer than travel upon public highways, publicly administered. But the continuance of this condition, at least as to the adequacy of train service, cannot go on indefinitely against diminished and inadequate revenues.

That careful and scientific investigation of passenger rates has shown them to be below the value of the service is proven conclusively by the findings of the Interstate Commerce Commission. Can you ask for any higher authority than the finding of this Commission charged with the duty of regulating the carriers of this country?

Acting upon this finding of the Commission, interstate passenger rates were increased generally to two and one-half cents per mile. If

a ticket from Buffalo to Cleveland (interstate) is worth two and one-half cents per mile to both carrier and passenger, a ticket from Cleveland to Columbus (intrastate) on the same train, is worth as much. Yet the law says it must be furnished for two cents per mile, which is less than the cost to the railway for rendering the service.

I know you will concede that confiscation is not reasonable or lawful regulation, and that under the guise of regulating passenger fares we should not be compelled to operate at a loss. Yet that is precisely the condition confronting the Ohio railroads today. The receipts of the Norfolk & Western for passenger fares in Ohio for the year ending June 30, 1914, were \$706,048.84. The cost of operating the passenger trains was \$683,658.57, leaving an excess of but \$22,390.27. Against this small balance is chargeable the taxes, interest and dividends apportioned to the passenger traffic. The taxes paid in Ohio chargeable to the passenger traffic were over \$63,000, so, without considering dividends, interest and the maintenance of equipment, roadway and structures, the Norfolk & Western operated its intrastate passenger trains in Ohio last year at a loss of over \$40,000.

The total valuation of the Norfolk & Western in Ohio for taxes is over \$26,000,000. The Norfolk & Western paid the state of Ohio in 1907 over \$136,000 for taxes, and last year paid more than \$316,000, an increase of more than 132 per cent, and not including the United States income tax. The taxes paid per mile of road have increased in seven years from \$514 per mile to \$1,245 per mile. But this is not all. Grade crossing elimination work in Ohio, ordered by the local authorities, will cost the Norfolk & Western about \$700,000 this year. During this same period in other states traversed by the Norfolk & Western our assessment for taxes has increased from \$530 per mile to \$788. While in Ohio passenger rates have been decreased one-third, our taxes are increased more than two and one-half times.

In addition to this, the increased value of passenger equipment demanded by the public will call for additional expenditures for such equipment, and additional taxes on the value of such equipment. The construction of wooden passenger cars has practically ceased. During the year 1913 and 1914, the Norfolk & Western has spent for steel passenger cars \$933,000, and to replace with steel the wooden cars still in use will require an expenditure of more than \$4,600,000—this for the Norfolk & Western alone. To replace the

wooden passenger cars of the railroads of the United States with steel will cost more than \$614,000,000; and yet the railways are expected to arrange for this expenditure, which will not add one dollar to the revenue, and for a business which is now handled at a loss for every passenger carried for two cents per mile.

At the time that the two-cent passenger rate law was enacted in 1906, it was argued by the proponents of the measure that the reduction of the rate from three cents would stimulate traffic, and that the increased traffic would more than offset the decreased rate. Experience has shown that this expectation has failed. In the year 1905, under the three-cent rate which then existed, the railroads of Ohio carried an average of 44 passengers per train mile, equaling \$1.32; while in 1914, in spite of the increased population, there were only carried 50 passengers per train mile, equaling \$1.00; so that your railways received 32 cents per passenger train mile in 1914 less than they received in 1905, and are only carrying an increase of 6 passengers at the end of nine years.

Every American takes pride in the passenger service of American railways. Here in Ohio, in the very face of adverse legislation, we have each year made betterments for the welfare and comfort of the traveling public. Roadbed, motive power, and equipment are the safest and best that money can buy. Safety and speed combine to make the journey of the traveler short and in comfort, and keep the business man in close communication with his affairs, however distant his trade and commerce may go and come. The roadbed has been made safe and is kept safe for you. The motive power is efficient and swift. The steel cars are safe and comfortable. Employees who operate the trains and keep up the tracks are competent, and are paid the highest wages of any railroad men. The rates charged for both freight and passenger service are the lowest in the world.

In the face of loss we have continued to improve our facilities, increase wages, and make betterments. We expect to pay—and do pay—a fair profit to the manufacturer on every car, every locomotive, every steel rail, every tie, and all other supplies that we buy. No man, no community, and no nation can prosper unless a profit is made. Every man in Ohio, whether he be a manufacturer, merchant, banker, farmer, or workman, expects and has the right to expect a profit upon what his energies and activities may supply to the world. It is not fair to ask any man to give of his talents or property

without a reasonable reward. You gentlemen do not do it and you should not ask the railroads to do it. The difference between you and the railroads is this: you will not operate your business at a loss—we have to.

All that the Ohio railroads are asking is fair and equitable treatment as between mutual business interests. The Interstate Commerce Commission, after an exhaustive investigation, has sustained our case for an increase of passenger fare, and named Ohio as one of the offenders in enacting confiscatory legislation as to such fares. All we are now asking the people of Ohio to do is to right the wrong.

Our appeal is made directly to the representatives of the people of the state and if this appeal is backed up by public sentiment enlightened by the information coming from such business associations as are represented at this meeting, then there will be no question that the injustice that now exists will be remedied by the law-making authorities.

PASSENGER FARES IN EUROPE AND AMERICA*

BY H. T. NEWCOMB.

Washington, D. C., May 12, 1906.

My Dear Sir:—I regret very much that the difficulty and delay incident to obtaining the necessary data have precluded an earlier fulfillment of my promise of December 19, 1905, to furnish you with tables showing comparisons between passenger charges on European railways and those in force for similar distances in the United States.

I now submit the promised tables. You will observe that I have followed your suggestion, that a comparison not unfair to the European railways can be made by setting against the first-class fares in force abroad the first-class fares charged in this country plus the Pullman fares. This conclusion seems to be justifiable. Perhaps, however, it will not do to say that it is always fair to American railways. On this basis the question of relative quality of service is left out of sight, although, if allowance could be made for it, it would render the showing still more gratifying to good Americans. This is especially true when the comparison is between ordinary first-class fares in Europe and the first-class fares in this country for a night journey plus the sleeping-car fares. The traveler in Europe obtains for his first-class fare the privilege of wrapping himself in a rug and of reclining as he can on the seats of his compartment; certainly obtaining a much smaller degree of comfort than if he had a berth in an American sleeping car.

In the following table I have compared the fares for distances from 51 to 392 miles, using the first-class fares for European journeys and adding to the first-class fares in this country the rates for a seat in a Pullman parlor car. You will observe that in all cases the points of departure and destination are given, together with the mileage, and for this country the railway and Pullman fares are stated separately, the totals also being given.

*Prepared for Senator Lodge and published in the Congressional Record June 8, 1906. Republished by request.

Journeys Compared		Dist. Miles		Fares			
American	European	Ameri- can	Euro- pean	American			Euro- pean
				Rail- way	Pull- man	Total	
Boston to Exeter, Mass.	Paris to Dreux	51	51	\$1 20	\$0.40	\$1.60	\$1.78
New York to Storm King, N. Y.	Paris to Compiègne	55	52	1.08	.50	1.58	1.90
Cincinnati to Dayton, Ohio	Modane to Turin	59	58	1.65	.25	1.90	2.34
Boston to Gardner, Mass.	Berne to Lucerne	65	60	1.42	.25	1.67	1.93
New York to Hyde Park, N. Y.	Paris to Orleans	80	78	1.56	.50	2.06	2.70
Albany to Herkimer, N. Y.	Paris to Amiens	81	81	1.62	.50	2.12	2.83
New York to Rhinecliff, N. Y.	Berlin to Stettin	90	84	1.76	.75	2.51	2.67
Philadelphia to New York, N. Y.	Turin to Bologna	90	91	2.50	.50	3.00	3.30
Albany to Utica, N. Y.	Turin to Milan	95	93	1.90	.50	2.40	3.36
Buffalo to Port Allegheny, Pa.	Paris to Rheims	97	97	2.85	.50	3.35	3.37
Boston to Springfield, Mass.	Bologne to Venice	99	99	2.56	.75	3.31	3.59
Boston to Northampton, Mass.	Paris to Dieppe	105	104	2.23	.75	2.98	3.63
Boston to Portland, Me.	Cologne to Treves	115	112	2.50	.60	3.10	3.43
Washington to Harrisburg, Pa.	Lucerne to Pino	127	122	3.74	.75	4.49	5.07
Cincinnati to Louisville, Ky.	Bologne to Ancona	129	127	3.50	.50	4.00	4.67
Pittsburgh to North Girard, Pa.	Lisbon to Moura	132	132	3.95	.50	4.45	4.60
Washington to Philadelphia	Milan to Bologna	136	134	4.00	.75	4.75	4.84
Portland, Me., to Bangor, Me.	Paris to Douai	137	135	4.10	.75	4.85	4.71
New York to Albany	Paris to Lillebonne	143	135	3.10	1.00	4.10	4.58
Boston to North Adams, Mass.	Paris to Le Havre	143	142	3.61	.75	4.36	4.93
Duluth to St. Paul, Minn.	Athens to Patras	152	144	4.30	.50	4.80	4.82
Albany to Syracuse	Paris to Tours	148	148	2.96	1.00	3.96	5.14
Washington to Staunton, Va.	Paris to Lille	155	153	4.55	.75	5.30	5.34
Duluth to Minneapolis, Minn.	Coblenz to Cassel	160	155	4.30	.50	4.80	5.14
Pittsburgh, Pa., to Central City, Ohio.	Paris to Sedan	163	162	4.75	.75	5.50	5.62
St. Louis to Terre Haute, Ind.	Cadix to Cordova	169	165	5.23	.75	6.98	6.61
Indianapolis to Vandalia, Ill.	Irun to Burgos	172	167	5.17	.75	5.92	6.21
New York to Wilkes-Barre, Pa.	Vienna to Budapest	174	173	4.35	.75	5.10	5.20
Chicago to Oshkosh, Wis.	Madrid to Albacete	177	173	4.97	.60	5.57	6.47
Chicago to Hulsdale, Mich.	Madrid to Palencia	178	176	5.30	.75	6.05	6.58
Columbus to Indianapolis, Ind.	Rome to Cecina	181	175	5.30	.75	6.05	6.32
Chicago to Rock Island, Ill.	Ancona to Rome	183	183	5.00	.60	5.60	6.61
Cleveland to Springfield, Ohio.	Paris to Calais	183	183	4.80	.75	5.55	6.38
New York to Fonda, N. Y.	Hamburg to Strasburg	186	185	3.98	1.25	5.23	6.43
Pittsburgh, Pa., to Crestline, Ohio.	Pontealba to Verona	189	188	5.65	1.00	6.65	6.78
New York to Harrisburg, Pa.	Brussels to Paris	195	193	5.50	1.00	6.50	6.63
Chicago to Gladstone, Ill.	Paris to Dijon	196	196	5.89	.75	6.64	6.81
Council Bluffs to Kearney, Nebr.	Constantinople to Adrianople	199	198	5.95	1.00	6.95	9.47
New York to St. Johnsville, N. Y.	Berlin to Konitz	207	204	4.38	1.50	5.88	6.38
Cincinnati to Toledo, Ohio.	Pisa to Rome	211	207	6.00	.50	6.50	7.46
Boston to Lyndon, Vt.	Paris to Poitiers	213	209	5.24	1.00	6.24	7.27
New York to Boston, Mass.	Madrid to Sargossa	214	212	5.00	1.00	6.00	7.90
Albany to Fairport, N. Y.	Athens to Olympia	218	218	4.38	1.25	5.63	7.80
Boston to Schenectady, N. Y.	Paris to Nancy	219	219	4.84	1.25	6.09	7.63
Buffalo to Vernonia, Ohio.	Hamburg to Stettin	222	222	6.05	1.25	7.30	7.40
Albany to Rochester, N. Y.	Hof to Frankfurt-on-Main	228	222	4.58	1.25	5.83	6.82
Chicago to Amherst, Wis.	Paris to Luxembourg	236	234	6.58	.75	7.33	7.99
New York to Utica, N. Y.	Lisbon to Tavira	238	231	5.00	1.50	6.50	7.85
Baltimore to Deer Park, Md.	Cadix to Grenada	241	237	6.80	1.25	8.05	10.06
St. Louis to Indianapolis	Irun to Valladolid	242	242	7.40	1.00	8.40	9.01
Boston to Fonda, N. Y.	Nuremberg to Prague	245	244	5.38	1.25	6.63	7.81
Boston to Newport, Vt.	Paris to Nantes	250	246	6.35	1.25	7.60	8.66
New York to Rome, N. Y.	Paris to Limoges	252	251	5.30	1.50	6.80	8.73
Chicago to Alton, Ill.	Paris to Metz	257	244	6.55	1.00	7.55	8.44
Washington to Altoona, Pa.	Turin to Venice	259	258	7.69	1.25	8.94	9.29
New York to Oneida, N. Y.	Berlin to Dirschau	265	265	5.54	1.50	7.04	8.21
St. Louis to North Vernon, Ind.	Bordeaux to Narbonne	267	263	7.95	.75	8.70	8.80
Chicago to Aburndale, Wis.	Paris to Belfort	275	275	7.74	.75	8.49	9.57
St. Louis to Kansas City, Mo.	Cardova to Madrid	277	275	7.50	1.00	8.50	10.24
Chicago to Crestline, Ohio	Paris to Angoulême	280	279	8.00	1.50	9.50	9.71
Boston to Ithaca, N. Y.	Pontealba to Milan	285	281	6.18	1.50	7.68	10.10
St. Louis to Chicago	Tetschen to Vienna	286	285	7.50	1.00	8.50	9.83
New York to Syracuse	Madrid to Murcia	291	288	6.06	1.50	7.56	10.65
Albany to Buffalo	Paris to The Hague	297	297	6.15	1.50	7.65	9.77
Chicago to Louisville, Ky.	Madrid to Valencia	304	304	8.00	1.00	9.00	11.42
Boston to Rome, N. Y.	Cologne to Paris	311	306	6.70	1.50	8.20	10.21
Chicago to Columbus, Ohio	Paris to Lyons	314	312	8.35	1.00	9.35	10.83
St. Louis to Nevada, Mo.	Madrid to Santander	317	313	8.35	1.00	9.35	12.29
Boston to Oneida, N. Y.	Breslau to Stralsund	324	324	6.94	1.50	8.44	9.95
Baltimore to Greensboro, N. C.	Madrid to Cartagena	331	326	9.90	1.50	11.40	12.16
New York to Altoona, Pa.	Foggia to Bologna	337	327	9.45	1.50	10.95	11.80
Buffalo to Slatington, Pa.	Paris to Le Croisic	338	323	8.00	1.50	9.50	10.16
St. Louis to Cincinnati	Paris to Amsterdam	339	332	9.00	1.00	10.00	10.50
Baltimore to Pittsburgh, Pa.	Sofia to Varna	342	336	8.00	1.50	9.50	11.27

Journeys Compared		Dist. Miles		Fares			
American	European	Ameri- can	Euro- pean	American			Euro- pean
				Rail- way	Pull- man	Total	
New York to Charlottesville, Va.	Paris to Bale	340	338	9.90	\$1.50	\$11.40	\$11.40
New York to Charlottesville, N. Y.	Madrid to Seville	360	356	7.00	2.00	9.00	13.28
New York to Rochester	Paris to Bordeaux	371	361	7.68	2.00	9.68	12.55
New York to East Rush, N. Y.	Paris to Zurich	382	382	7.00	2.00	9.00	13.29
St. Paul to Lakota, N. Dak.	Madrid to San Sebastian	385	382	11.22	1.70	12.92	14.22
St. Louis to Parsons, Kans.	Paris to Lucerne	387	386	10.10	1.00	11.10	13.47
Chicago to Hastings, Minn.	Paris to Brest	390	388	10.89	1.00	11.89	12.88
Baltimore to Buffalo	Irun to Madrid	392	392	10.00	2.00	12.00	14.59

In the following table, the distances being longer than those in the first table, I have used the rates for a double berth in a sleeping car instead of those for a seat in a parlor car. In all other respects the data correspond.

Journeys Compared		Dist. Miles		Fares			
American	European	Ameri- can	Euro- pean	American			Euro- pean
				Rail- way	Pull- man	Total	
Chicago to Des Moines, Iowa	Madrid to Seville	358	356	\$10.15	\$2.00	\$12.15	\$13.28
New York to Batavia, N. Y.	Madrid to Monforte	404	401	8.30	2.00	10.30	13.98
Philadelphia to Greensboro, N. C.	Madrid to Huelva	424	424	12.70	3.00	15.70	16.03
Washington to Buffalo	Paris to Darmstadt	438	427	11.20	2.50	13.70	14.89
New York to Pittsburgh, Pa.	Berlin to Instenbourg	444	424	10.50	2.00	12.50	13.04
Chicago to Kansas City	Madrid to Cadiz	458	439	12.50	2.50	15.00	17.49
Washington to Alliance, Ohio	Paris to Chateaulin	458	445	10.50	2.50	13.00	13.34
Boston to Batavia, N. Y.	Pino to Rome	463	449	9.65	2.50	12.15	16.19
New York to Irving, N. Y.	Paris to Avignon	468	461	9.25	2.50	11.75	16.04
New York to Dunkirk, N. Y.	Berlin to Vierjbolovo	480	461	9.25	2.50	11.75	14.21
Chicago to Omaha, Nebr.	Milan to Foggia	490	462	12.75	2.50	15.25	16.64
New York to Brocton, N. Y.	Hamburg to Dantzig	489	489	9.45	2.50	11.95	14.42
St. Louis to Athens, Ohio	Paris to Turin	497	496	13.05	3.00	16.05	17.51
Washington to Maysville, Ky.	Paris to Hanover	536	507	14.00	3.00	17.00	17.35
Boston to Dunkirk, N. Y.	Madrid to Vigo	539	511	11.80	3.00	14.80	16.79
Cleveland to St. Louis, Mo.	Foggia to Turin	548	536	15.00	3.00	18.00	19.30
Washington to Columbus, Ohio	Paris to Nuremberg	568	540	12.75	3.00	15.75	19.48
Council Bluffs, Ia., to Denver	Paris to Milan	572	559	17.00	3.00	20.00	20.30
Chicago to Emporia, Kans.	Paris to Hamburg	586	582	15.85	3.50	19.35	20.15
Boston to Erie, Pa.	Paris to Munich	587	571	12.65	3.00	15.65	20.57
Washington to Dayton, Ohio	Paris to Marseille	639	536	14.00	3.00	17.00	18.63
Washington to Atlanta, Ga.	Paris to Leipsic	648	647	17.50	4.00	21.50	22.29
Chicago to Weedsport, N. Y.	Paris to Cannes	657	656	14.25	3.50	19.20	22.82
Boston to Mentor, Ohio	Belgrade to Constantinople	660	659	14.25	3.50	17.75	21.81
Washington to Richmond, Ind.	Paris to Nice	688	675	15.00	4.00	19.00	23.50
New York to Toledo, Ohio	Paris to Barcelona	736	708	16.25	4.00	20.25	25.25
New York to Indianapolis, Ind.	Paris to Carlsbad	825	728	19.00	5.00	24.00	24.46
New York to Chicago, Ill.	Paris to Copenhagen	912	804	20.00	5.00	25.00	28.49
Boston to Chicago, Ill.	Paris to Madrid	1006	902	22.00	5.50	27.50	31.78
Chicago to Fort Worth, Tex.	Paris to Gothenburg	1109	985	26.40	6.00	32.40	34.39
Chicago to Denver, Colo.	Paris to Stockholm	1210	1208	29.50	6.00	35.50	42.71
Philadelphia to Omaha, Nebr.	Paris to Belgrade	1312	1247	29.50	7.50	37.00	43.28
Philadelphia to North Platte, Nebr.	Paris to Bucharest	1603	1587	38.05	9.50	47.55	49.93
Philadelphia to Sidney, Nebr.	Paris to Adrianople	1726	1707	41.80	10.50	52.30	59.43

Where sleeping cars are available in Europe, the rates are still higher and vastly exceed those via the American railways. The following table shows the charges from Paris to the destinations named via the Oriental express in comparison with rates for similar distances in the United States. The charges in both cases include a berth in a sleeping car:

Journeys Compared			Distance in miles		Fares (plus sleeping- car fares)	
American		European, from Paris to—	Amer- ican	Euro- pean	Amer- ican	Euro- pean
From—	To—					
Baltimore.....	Pittsburgh, Pa.....	Strasburg.....	342	313	\$10.00	\$13.84
New York.....	Rochester.....	Carlsruhe.....	371	365	10.18	16.63
New York.....	Batavia, N. Y.....	Heidelberg.....	404	390	10.30	17.57
Washington.....	Buffalo, N. Y.....	Stuttgart.....	438	422	13.70	19.06
Chicago.....	Kansas City.....	Frankfort-on-the-Main.....	458	445	15.00	19.08
Cleveland.....	St. Louis, Mo.....	Nuremberg.....	548	540	18.00	24.34
Council Bluffs.....	Denver, Colo.....	Munich.....	572	571	20.00	25.55
New York.....	Toledo, Ohio.....	Carlsbad.....	736	728	20.25	30.46
New York.....	Chicago, Ill.....	Vienna.....	912	861	25.00	38.35
Chicago.....	Fort Worth, Tex.....	Budapest.....	1109	1024	32.40	47.47
Philadelphia.....	Omaha, Nebr.....	Belgrade.....	1312	1247	37.00	57.19
New York.....	North Platte, Nebr.....	Bucharest.....	1693	1587	50.80	64.40
Philadelphia.....	Cheyenne, Wyo.....	Adrianople.....	1828	1707	56.40	75.03
New York.....	Denver, Colo.....	Constantinople.....	1971	1915	59.75	75.03

If there is anything further than I can do for you in this connection, please let me know.

Very respectfully, yours,

H. T. NEWCOMB.

HON. H. C. LODGE,

United States Senate, Washington, D. C.

RAILROAD VALUATION*

BY H. H. EDGERTON,

ASSISTANT ENGINEER, CHICAGO GREAT WESTERN.

Railroad valuation is a mole hill that develops into a mountain, and not a smooth conical mountain either, but one with spurs, precipices, and subterraneous caverns. At present the Interstate Commerce Commission is in one of these caverns, and they do not know the size of the mountain on top of them.

There are many different kinds of value to a railroad mainly depending on the purpose for which the valuation is made; for taxation, speculation, hauling capacity, rate making, etc.

SPECULATIVE VALUE.

Some roads are so situated in their relations to other roads and commercial centers, that as long as these relations exist they pay good dividends, and this is reflected in the selling price of their securities. The case is illustrated by some belt lines, coal roads, etc. Their returns are good as long as it best suits the two controlling ownerships to have it that way, and it is a speculation how long this condition will last. This is entirely outside of stock gambling speculation. We have nothing to do with that.

STRATEGIC VALUE.

The occupation of certain territory in such a manner that it is nearly impossible to parallel them by other lines, or reach the same territory by somewhat divergent lines. There are many cases of this kind, as for instance, the New York, New Haven & Hartford's Long Island Sound line; the two Hudson River lines; the Denver & Rio Grande's position in the canyon, etc., etc. It is worth something to be in a position that can not be duplicated, and this condition has a value.

HAULING CAPACITY VALUE.

There are a number of roads so situated that they can haul between two points much cheaper than competing lines. This has a value to it, and there is no way of getting around it. Temporary schemes and other routing may maintain adverse conditions for a while, but the cheaper haul, the one that burns the least coal, will survive in the end. There are so many cases of this kind it is

*Written for Railway Engineering and Right-of-way.

hardly worth while to cite any of them. The Chicago, Burlington & Quincy line along the Mississippi River is one of them. They possess a superior advantage in cheap haul on account of nearly level grades following the river which their competitors do not, and this condition has a value. It also has an example on a smaller scale in the prices of rents in a city, so these examples are all around us and the condition is apparent to everyone.

THE PHYSICAL VALUE.

It is pretty well settled that this is to be the cost of duplication or reproduction, though this is only a fairly safe basis, and there will be some almost absurd situations arise. For instance, the prices of certain kind of track material are much cheaper now than they used to be, owing to improved processes of manufacture, so that after bettering the line by replacing the worn out with new and heavier rail, the additions and betterments account will show a loss instead of a gain. There are a number of cases where a railroad has invaded a residential suburban district and bought up land and established a freight yard, when at that time high prices had to be paid for the land. Now that the railroad is there, and has on account of smoke, noise, etc., made the neighborhood undesirable for residences, so that if the road needed any more land they could now get it much cheaper than they could say twenty years ago. The question now arises, what is the value of the railroad estate; is it the value that they paid for it or is it the value of the adjoining town lots?

Then there are two forms of physical valuation; cost of reproduction new, and cost of reproduction less depreciation.

COST OF REPRODUCTION NEW.

The cost of reproduction new, what it would cost to build new as it now stands, is one of the methods laid down by the act of Congress authorizing the Interstate Commerce valuation. It is also one of the most favored by the engineering profession, because it eliminates the troublesome feature of deducting for depreciation. In compiling what a road would cost if built anew again, one should attempt to follow out to a certain extent the steps that were taken in its original construction, and consider the condition under which it was built. It is unfair to consider that a road could get its material delivered along its line by other roads, when those other roads were not built at that time, and there was likely a heavy expense for carrying forward the material. It is not in-

tended though that the prices that governed in the early days should hold now, for ties may have been 10 cents and labor \$1 a day. It is the cost of reproduction new, and now.

COST OF REPRODUCTION LESS DEPRECIATION.

This is also one of the methods mentioned in the act of Congress, and it seems a very stale way of doing. It brings it up to the day and date, but a new valuation will be needed a year hence, and depreciation seems to be one of the losses assumed by the stockholders in every corporation, and is expected to be provided for in the operating expenses.

If for any reason it is insisted upon, elaborate depreciation tables will be necessary to make the proper deductions. These, of course, can be compiled by taking the life of ties, of locomotives, and the probable life of buildings, etc., but in some cases it has a nasty lot of probability in it, and especially in the life of buildings it will depend on the maintenance operations, how often they paint and how often they reshingle. For every road there will have to be a special set of depreciation tables to suit their conditions, as ties that would be perfectly serviceable in one dividend-paying plant would be ruinous to use in some other transportation plant, and the same may be said of rolling stock, depots and other facilities; what might be scrap on one railroad could be utilized on another, and would have a different depreciation rate.

Since physical valuation is going to be the main issue, the thing that is now uppermost in regard to it is the cost of making it. Many roads have not yet begun, and those that are at it have not seen the end. There are many different methods of procedure, all the way from shiftless to thorough, and a moderate classification of these methods of making a physical valuation here follow:

CLASS 1.

On paper, in the office only, cost per mile. \$8.00

The above cost of \$8.00 per mile is based on taking it for granted that the road already has profiles, station maps, right-of-way maps. The amount of material in the cuts and fills is calculated from the profile, presuming that the cross sections are level or correcting them by slope angles where they are known not to be. At the best it is a loose method; many things may be overlooked that are not shown on the records, and the result is likely to fall 25 per cent short of a more thorough method. Roads which have not a complete outfit of profiles, right-of-way maps and station plats will have to do field work and spend more money per mile.

CLASS 2.

With field inspection of track and structures, cost per mile...\$16.00

This field inspection will be very light; to include merely the walking over the line by three men to check up frogs, switches, track material, buildings, etc. It adds a good deal to the value, for it is surprising to find how many things are omitted from the standard yard maps, etc.

CLASS 3.

Field and office work combined, cost per mile.....\$30.00

This will include the measurement of the widths of the cuts and embankments, and though they are only measured on the base, the method will add largely to the value of the roadway, and will bring the results to within a small per cent of the right amount. It will also include a count and a check of the track material and buildings. But there will be no time for regular cross sections of the roadway.

CLASS 4.

Actual measurements of cuts and embankments, cost, mile...\$65.00

This based on the assumption that the right-of-way maps and station and yard maps are fairly well up to date. It does not give the margin that is necessary for complete valuation.

CLASS 5.

Complete physical valuation, cost per mile.....\$75.00 to \$125.00

This means actual measurements of cuts and embankments, yards, terminals, track material, structures and real estate, and a careful consideration of all the steps necessary to build up a working transportation plant.

CLASS 6.

Government valuation, if they do not change their ways, per
mile\$250*

TABLES OF UNIT PRICES.

The first step, and almost before the organization of the working corps, is to establish a list of unit prices. This table should include everything used on a railroad, excluding possibly the mechanical department, which should be a separate volume, and if properly done it will be an indexed book of many pages. Tables of other roads, and the purchasing agents' and storekeepers' lists should be freely consulted, as no man can, from his own mind, compile one. In it should be stated the cost of excavation, masonry, ties,

*For the 260,000 miles of railway in the United States this would involve an expenditure of over \$65,000,000!

switches, rails, etc.—everything used on a railroad, and that means a good deal. These lists of items should be typewritten on tracing cloth with several columns for prices on the right of the page. These latter are necessary for the placing of the dollars and cents in which changes may have to be made. The space should be ruled and left blank, and the dollars and cents afterward written in by hand on the white prints made from the negatives of these tracings.

Each division will likely require a separate statement of prices as these will change somewhat with the locality; ties will be cheaper in Washington than they are in Dakota, and excavation of earth costs much less on some parts of a system than it does on others. A number of these volumes will be necessary for each force on each division, so the men will not have to wait on one another for the use of a book.

WHAT IS TO BE VALUED.

To say what is to be valued is impossible, the list is too long and complicated; the history of the work only can show up the steps that were taken, the costs that arose in connection with it. To reproduce the plant is of course the essence of the instruction, but even this is not as simple as it seems. Before attempting a valuation the engineer should have been a long time on railroad construction to know the process of producing mile after mile of a transportation plant, for if he is not such he will just estimate what is apparent, and overlook the many auxiliaries that were at one time necessary steps in the construction. A few of these are mentioned from a long list, and often it will become a matter of judgment what is right and proper and what is not.

Temporary trestles and bridges were necessary in the cases of some long roads, by this is not meant those small affairs used to make large fills; they should be included in the price per yard of the embankment, unless they were very large ones. But those trestles and temporary bridges were necessary for river crossings, so that the road could be shoved on ahead to get supplies up at the front, and perhaps partially put in operation to help pay the fixed charges on the capital invested, until permanent bridges could be put up. Without such temporary trestles and bridges, long lines of road would be many years in building, and in the meantime the interest on the money invested would eat up the enterprise. All such structures, though they have long since disappeared, are an essential part of the cost and should be included in the valuation.

Also include temporary material yards. All long roads require them well up at the front, and without them chaos results in the forwarding and distribution of supplies. Though pulled up and abandoned, so that sometimes hardly a trace of them can be found now, the valuator should become a sort of historian, and write up as nearly as he can their probable cost from such information as can be gathered from old maps and profiles.

The same can be said of switchbacks over mountain passes, sometimes used for many years until a tunnel was built. They were a necessary part of the enterprise, and would be one of the essential steps if the railroad was reproduced again.

Ditches to drain swamps, dams to raise rivers, so that timber might be floated down, or supplies brought up; and water supply works, etc., are often essentials costing money, and have frequently been works of such magnitude that they were not included in the price per yard of the roadbed, and therefore should now appear separately valued as part of the cost of the plant.

The cost of what turned out to be experiments or temporary lines now abandoned, even though used for many years, should be included in the value of the road. Under such heading would be included places where a mountain continued to slide or a swamp continued to settle, so that a new line had to be built. There is, however, a chance for a difference of opinion here as some contend that cost to reproduce the road as it now is should be rigidly adhered to, as the allowing of any leeway from that leads to the inclusion of now abandoned strips of roadway built for some ulterior reasons and not for experiment or temporary expediency. For instance, it has been said that for a short period the policy of one administration of a subsidized transcontinental line was to build the road more crooked so as to take in more of the government land of the alternate sections donated to them for 20 miles on each side of the line, and they figured on straightening out their road after they acquired title. Then again there is the case of a director casting the deciding vote in the adoption of an alignment that would enhance the value of certain real estate in which he was a silent partner. Then there is the doubtful practice of deviating the alignment so as to reach certain boundaries, and prevent the subsidizing of another road adverse to the interests of one of the directors, but not to the project in question. These are some of the arguments that are presented by those in favor of valuing a road as it now is, without regard to some of the many expenditures for abandoned track that was once a necessary part of the whole.

While this matter has been dealt with by the Interstate Commerce Commission, there is a strong sense of justice that if the deviation was known to have been made for other purposes than legitimate transportation, the property value of the road will have to suffer a loss the same as if the money was purloined from the treasury by more open fraud. See "Accounting for Abandoned Property," Interstate Commerce Commission, Feb. 10, 1912. Public document.

SOME ITEMS TO BE CUT OUT.

An item which should be deemed improper is the 6 per cent or 10 per cent of the total cost paid to some contractors simply for the use of his office and name. This view differs from that of Mr. Wilgus, who holds that large undertakings require large contractors (sometimes large in name only) to undertake the construction of a long line of railroad. If he furnished all the plant or money this head contractor might be worth the price, but too often he owns nothing but an office, and is without machinery, plant, or capital; pose and ability to handle the board of directors are his main assets. He lets out the work in 10 or 20-mile sections, and receives 6 per cent on the prices of his subcontractors. There was one case where a head contractor did not even have the expense of checking the payments, handling the payrolls or monthly estimates. All he wanted to know was the total amount and collected 6 per cent on that; the subcontractors furnished the capital, plant and responsibility. To enlarge his office into a lounging room, install some easy chairs, and entertain the board of directors were all the visible additional efforts he entered into. In the construction the chief engineer's office could as well have attended to the apportionment and letting of the work in suitable sized contracts. And this 6 per cent sometimes has amounted to a million or two of dollars. The whole arrangement smacks of a "blow back" to the directors or officials who sanction such an arrangement.

And in this manner of procedure the expense has not been limited always to as low a figure as 6 per cent. Many and varied are the wheels within wheels of construction companies that receive so much per mile, and various classes of bonding and underwriting arrangements which increase the cost unnecessarily. Some of them, however, are absolutely essential; this only applies to those who do not give value received.

The value of a franchise should be omitted in a physical valuation if it came as a free gift from the State or municipality.

It should not be figured as part of the capital of the road, and used as part of the investment upon which rates are based; "the public expects to pay no taxes upon that which they gave freely."

"Good will" does not properly concern a physical valuation, but even in the final balance sheet handled by others than the engineer it is doubtful if it should appear, as there is a question as to its existence, and no measure of its limits. Good will in the railways' case simply means the advantage to ship. Let the rate be lowered by another route and see how long it will last.

In the matter of value of streets crossed or occupied by the railway; if this was a free gift from the public it should not be accredited to the capital account. Also overhead highway bridges, if the item was paid for by a municipality, and not constructed by the company, it comes in the same class as the crossing facility of a foreign line.

OFFICE FORMS FOR VALUATION.

Almost every railroad system will require some special variety, but the best forms up to date are those arranged under the direction of Mr. E. Holbrook for the Union Pacific system. A road just starting in on a valuation would do well to follow them with such additions as may seem necessary for their own special case, and all valuation engineers who are now conducting a work, if they would examine a set of them may get some surprises to see how well and thoughtfully the compilation of data has been provided for, and be able to correct some bad arrangements and oversights of their own. The height of perfection is the arrangement of the data to take care of the past, the present and the future; to so arrange the summaries of quantities so that the original amounts, development cost, appreciation, present amounts, depreciation, additions and betterments, are so separated that the work will not have to be done over again to arrive at any type of valuation at any time in the future, whether for taxation, bond issues, rate making or what not.

The Government valuation force is also getting up a set of forms. These will likely become standard in the course of years when they learn their lesson and find out what they want. An attempt was made by the Interstate Commerce Commission to enforce a certain standard of sheet maps, 20 inches by 56 inches in size, one for station maps, one for right-of-way maps, and one for profiles. Samples were sent to the railroads with the request that they take these as standard, and prepare a complete set of

their maps to correspond. But when presented to the country at large many omissions and conflicts were found in these standards and they were afterward withdrawn. The Commission evidently found that it takes a committee of broad experience to get up a standard that will suit conditions of real estate boundaries, track and building construction from Cape Cod to the Golden Gate. Their station plat carried a decidedly eastern air to it, as was shown by the street names, which were mostly those of Charleston, S. C., and by the lack of discrimination in the dot and dash of boundary lines, to make them applicable to township, range, section, half and sixteenth section lines of a sectionized country.

VALUATING RIGHT OF WAY.

To set a value on the right of way as real estate is one of the most difficult parts of the work, as it presents nothing tangible, has no index to itself, and but slight chance of arriving at it by mere measuring and figuring, and applying a unit rule.

Present value if sold.

The price it cost at the time it was purchased.

The price it would cost if purchased now.

None of these as basis for valuation can be applied rigidly, but this information should appear in separate columns to get as much history of the tract as possible, and also there should be columns for overhead charges in buying right of way, clearing title, value of buildings that were on it and the cost of removing buildings.

In some cases railroads have depreciated adjoining property, and have as often made the property more valuable. The price it would cost if the railroad did not exist, but that the town had grown normally without the railroad, seems to be a fair average; that would increase the cost over and above what it was 20, 30 or 40 years ago, yet not expose it to the fluctuation caused by the proximity of the railroad. But the valuator must look into the history of the various transactions, and take into consideration some conditions that actually existed at the time of the purchase. To not do so would be unfair to the capital invested. For instance, the new line of the C., R. I. & P. in Joliet necessitated the tearing down of a hotel worth \$100,000. The appraiser might not know this, yet it is a part of the cost of the railroad.

Once away from the towns and the terminals and into the open country the work of valuating becomes much more certain, and the sale value of the adjoining farms may be said to govern, having

due caution, however, in regard to some inflated value of fruit lands, and "sunshine" tracts, temporarily high priced for climatic reasons and the gullibility of the would-be fruit raiser.

Before parting from the subject it is earnestly hoped that some instructions will soon be forthcoming from the Interstate Commerce Commission and the Railroad Presidents' Association.

VALUATING ROLLING STOCK.

This should be handled by the mechanical department, and some very good forms have been prepared for this purpose. They should be wide enough in scope to allow for the presentation of the actual cost of a piece of rolling stock to the company. The list price, the amount that was paid for it is all well enough, but arrangements should be made to include the cost of design and delivery. Some of these items may be properly charged to operating expenses, but there should be a clear-cut line drawn at what it is worth when ready to use. There is always an expense for design, an expense for delivery, and an expense for breaking in a new piece of rolling stock that adds to its cost before it is ready to use for operation.

PROCESS OF VALUATING YARDS.

The danger of omission in a yard valuation is great, even with an up-to-date yard map. To get the frogs, switches, etc., the best way is to consider the whole yard as laid off in 100x100 foot squares, and use a latitude and departure system. Then every piece of material will have its number by westing and northing. In this way the danger of omission and duplication is reduced to a minimum. The system was first devised by H. R. Barnes in the field work for valuing the C., M. & St. P. yards around Chicago. The system can be used even in yards that are on a curve. The boundaries on one side of the blocks can conform to the curve line, and the other side to the radii of the curve, taking the farthest out track as the 100-foot chord measure, but in numbering the squares and designating material by latitude and departure, you must consider the yard as being on a tangent. The transit party should number everything as so much north and so much west, using a good yellow crayon, and then another party of two men follow, afterward noting in tabulated field books the kind, weight, size and amount of material.

VALUATING THE DEVELOPMENT COST.

This is another one of the intensely argued points. In the first place the term is a wide one, and heretofore has often been used

to cover a multitude of sins, if not actual fraud. To give the term an interpretation, development cost means advertising, subsidizing industries, encouraging settlers and farmers, building experimental tracks to doubtful localities; in fact, doing things that will build up the country and make traffic; and last, but most important, it means that cash which is necessary to expend before the line becomes a paying proposition—the money over and above the cost of construction.

After a road is built it generally takes several years before there are enough industries along its line to produce sufficient tonnage to make the road pay. In the meantime it has to be operated probably at a loss, and this together with the money it takes to pay the interest on its indebtedness is the development cost.

Many of our trunk line roads were built into uninhabited regions, and it took years before settlers, their crops and industries, produced sufficient tonnage to make the road pay. The probability of these conditions was early recognized so that the Government subsidized some roads with large grants of land, with the intention that the sale of these lands would help tide them over the development period. While in the main the most of this land grant domain has fallen into the hands of the settlers it was intended for, yet large portions of it saw many ownerships and much fraud before it passed under the plow of the bona fide traffic producer. Transfers of large blocks of it went to subsidiary companies, and valuable town sites were deeded to a favored few, so that the choicest income went elsewhere than to pay development expenses.

But the fact is that there has been and is yet such a thing as a legitimate development expense. With almost every industry there is a period between the time when manufacture begins and when sales become profitable. This is recognized by all promoters and good business managers, and funds to tide this period over have to be provided. A creamery has to await the time when the neighboring farms will have enough cows to provide sufficient milk; a shoe factory has to await the time when its traveling salesmen have established enough trade and can get enough orders to make the sales sufficiently large to be profitable. The question now is, is this money part of the cost of the road, part of the capital account, or should it be charged to operating expenses. This is one case where a rigid physical valuation may not represent the requirements in giving proper measure of the worth of the property. In nearly every other business transaction it is recognized as part of the value

of an institution, something that has cost money and something that has a real asset. Take for instance a hotel that might have been running three years before a sufficient number of the traveling public came nightly to fill its rooms. The expense of operation was going on all that time, and if the business was transferred, the money it invested during that period in getting its start, would be recognized and capitalized as part of the assets of the plant. Now a great many of our railroads are owners of hotel systems. If some of these buildings were put on the market as so much lumber, stone and labor, they would be jumped at as great bargains, while some others might not bring the price of firewood, and it is soon going to be a question in some men's minds as to how much they are worth. The safest way, of course, is to adhere rigidly to the cost of reproduction. But if this is done throughout, the railways will stand alone in the business world as freaks who spend money for nothing.

There are some classes of development expenses that may be inventoried and priced as measurable quantities, and, divested of any appearance of fraud, are truly a benefit to the railway and the community. Many are the cases where a road has through the action of its board of directors made large investments in the stock of new industries, knowing full well that these industries would go into the hands of a receiver, and the money lost so far as the road was directly concerned, but they had the foresight to know that they would eventually pay out and become good tonnage producers.

Among this class, which the roads helped along, may be mentioned dams, sawmills, irrigation ditches that have served their time, mines that failed to pay, toll roads, industrial expositions and experiment farms. The original cash value can still be determined for a number of these, and where such is the case and no fraud appears they should be part of the cost of the road, and taking them altogether, they make quite a portion of the expense of the development of the country until the road was on a paying basis.

One of the strong arguments against allowing any development cost is that many of our railways were built as promotion schemes and from start to finish never had any chance to pay out or get out of the development period, and were never expected to be anywhere else, and it was known by their promoters that failure and absorption would mark their end. Many and powerful are some

of these arguments, but as a matter of fact such a cost does exist, especially measurable in the case of interest paid on the money used, and the engineer who ignores it will place himself within the scope of that metaphor, "Figures do not lie, but liars use figures." And many of these strong arguments come from the very cream of the engineering profession, and taking this as the measure of their common sense it is not strange that so many of them make failures when they branch out as business managers or contractors, and separate themselves from a pay-roll kept alive by broader minds. And we also have a court's decision on this development cost covered by the following words: "The value of that which it employs for the public convenience," *Smith vs. Ames*, 169 U. S. 522, and while we may have to get another court's interpretation on this court's decision, it is safe for the present to maintain that if this money was used for the proper development, and to maintain and run this road for the public convenience, it is part of the cost of that enterprise, however fallacious its inception and location might be.

ITEMS OF APPRECIATION.

Some items of a railway grow better with age, and this is called appreciation or an increase in value over and above their original cost. What this increase is theoretically worth has been tabulated for some roads and some states, but whether suitable for other systems and localities is unsafe to say. Certain it is, though, that a cut or a fill that has developed a good growth of sod on the slopes is worth more than a fresh made one. This is also true of more solid fills and better drained cuts, and of some forms of river and harbor protection; they are much better now than when first made. The present ballast on a roadbed that can be seen and measured is perhaps but a small part of what has been sunk in there, of the many coats that have gone before and helped to make the track as stable as it is. Snow fences and sand dune protection come in the same class, as it probably required many moves to find their best location, all of which took money and is part of the cost of the road, and makes them worth more, over and above their measured value. There may be some brilliant arguments against this, but the proper measure is the facts. However, great care should be taken not to confuse with these what is properly a maintenance charge.

SOME ITEMS OVERLOOKED.

The cost of inception and promotion, often the life-work and financial ruin of some hopeful individual, should not be overlooked. While some projects, by weight of necessity, have boosted themselves, the great majority of them were one-time nurslings of some few men who had faith in their own visions. Right big men there have been, and right small men there have been, from J. Cook, the banker, down to the penniless fur trader, who have sacrificed their means to support initial developments of transportation projects; and trips into the interior, trips to Washington, trips to Europe to raise money, costs of maps and publications, charters, expert lawyers' fees, expert engineers' fees, and preliminary surveys have all been paid for part in grief and part in money. There is no way of measuring it, but wherever an item of the kind is come across, and can be properly identified, it should be tabulated in the proper sheet and column to be credited to the cost.

The payment of bonuses for money, if not so exorbitant as to be criminal, is as legitimate a cost item as any other commission or fee, for the brains that know where the money is to build the project are worth as much as the brains that know where the road should go.

The cost of advertising and the solicitation of loans.

The cost of winter work where large forces of men were used shoveling snow to keep the trails open.

There is no possibility of listing all these items, but when they appear as one of the necessary steps to construction they should be given credit in columns allotted for the purpose. In this respect and particularly in regard to items that might be called in question by others, never submerge anything by addition with anything else, but leave it so it can be taken or rejected; use more columns; use more paper, and leave the record clear, so that others can understand it and add it up to suit a condition or a court decision that might arise.

ENGINEERING AND SUPERINTENDENCE.

For a long time it has been customary at the tail end of a statement of cost to throw in 10 per cent for engineering and superintendence, and it seems strange that this is done when all the other details are gone into so carefully. Perhaps it is but another instance of the old saying, "shoemakers' children always go barefooted," that the engineer after counting every bolt and rivet, every tie and rail fastening, and so carefully analyzing the various branches of the work, is incapable of placing any other estimate than 10 per cent on

his own services. More often than not the office records show how many preliminary surveys, how many location surveys were made, and how many resident engineers were used on the line, and even if they do not, he should be a very good judge of the personnel and expense he would use if in charge himself, and he should not forget the tie and timber inspectors, the steel and other material inspectors, who are on the pay-roll but not in evidence on the job. The various items of a railroad's cost are each in themselves but small per cents of the whole, and if handled as carelessly as the engineer does his own services, the valuation would be nothing but a bare-faced guess. This matter has already been brought in question by administrative heads of many railway commissions who are not engineers and who do not appreciate our idiosyncrasies in playing Hottentot with our own figures, and thus imitating those natives of Africa whose mathematical abilities are limited to the count of the fingers on the two hands—namely 10. Engineering and superintendence might be more and might be less than 10 per cent, but it should be ascertained to a certainty, or estimated as near as possible; not lumped in.

A PARTIAL LIST OF PUBLICATIONS ON PHYSICAL VALUATION.

The American Society of Civil Engineers has issued a list of 398 books, pamphlets and periodicals on the subject of valuation exclusive of street railways. The U. S. Government (Library of Congress) has issued a list of 119 works, mostly public documents, and regular firms of scientific book publishers have large lists. So there is ample material available for those who wish to inform themselves. But most of these writings are from the talkers; the doers are not very much in evidence. It is criticism in advance of the real work; instructions how to do it are very much lacking. There are too many of them written with a feeling of unrest, a fear that valuation is wrong, and with an idea to protecting interests that pay fees and salaries; that something will be done which had better be left undone; that somebody is going to make a mess of something. And in a number of ways these fears are well founded. Something is going to happen. The railways will have to come up to date, abreast of other business institutions, and know the value of their plant, and the 10 per cent engineers will have to change their ways and learn to look as carefully on their own labors as they do on the work of others. Hundreds of engineers know the business already; many more hundreds will have it to learn. The best schooling is to be actually in the work on several hundred miles of line, and those who know it the best are those who do it the most—the U. S. Civil Service Commission to the contrary notwithstanding.

“RAILWAY PROPERTY VALUATION FOR PURPOSES OF REGULATION” *

BY PIERCE BUTLER,

VALUATION COUNSEL OF WESTERN GROUP OF RAILROADS.
TO THE WESTERN ECONOMIC SOCIETY.

The title of this paper is included within quotation marks to indicate the thought, frequently expressed, that value for the purpose of rate regulation is not value in its broadest sense. It is not to be understood that because of the use of that title the writer approves any such doctrine. To him it seems that the ascertainment of the value of a thing, whether it be a vacant lot or a railroad property, is the determination of a fact, and that the same property cannot be of two or more different values at one time.

In recent years the subject of valuation of railroad properties has received much attention. * * * *

Until recently, the reproduction method was insisted upon by the states as the best one for the ascertainment of the present value of railroad properties. In some instances at least the state appraisals have made it perfectly plain that existing schedules of rates were not high enough to maintain the property, pay operating expenses and taxes and to yield a fair return upon the value so ascertained, and, since the failure of such appraisals to justify further rate reductions, much diligence has been exercised on the part of many to find a lower basis of valuation. The cost of the property is now proposed by some, who undertake to speak for the public, as a substitute for, or the equivalent of, value.

It is clear that reliable knowledge concerning the value of railroad properties may be useful for various purposes; for example, as a basis for taxation, as a guide to investors in railroad securities, as an aid to the public control of the issuance of stock and bonds, as an aid to test the reasonableness of the general level of rates, and as a guide for further legislation.

It is, however, a mistake to suppose that railroad rates are, or as a practical matter can be, made or based upon the value of the property used to render the service. By those who have given attention

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to the subject it is well understood that rates substantially depend upon many other considerations. Carriers between competitive points must maintain the same rates, and no shipper, locality, or class of traffic, can be given any undue advantage or subjected to any undue disadvantage. The half dozen or more railroads engaged in active competition for traffic moving between the Twin Cities and Chicago must establish and maintain the same rates. Rates from different sources of production of the same or like commodities to the markets therefore, or to the places where the same are consumed, must necessarily bear a certain relation to each other. The effect of the transportation upon the value of the thing moved, the value of the service to the shipper, the cost of the service to the carrier, the nature and extent of the risk involved, competition between carriers, places and commodities, and many other circumstances, must be taken into account in making rates. Rates made by the railroad companies themselves have never been based upon the value of the property employed to render the service, and rarely, if ever, has any public authority attempted to make rates based upon such value.

RATES SAID TO BE CONFISCATORY.

In recent years there have been many suits in court brought by railroad carriers to set aside state made rates as unconstitutional and void because confiscatory. In all such cases the value of the property used to render the service covered by the rates complained of is an essential fact. It is, however, well known that rates may be high enough to be non-confiscatory and yet much below what is reasonable and just under all the circumstances. Because of the nature of the business of common carriers and the interest of the public therein, the common law imposed the duty upon those engaged in it to serve all indifferently to the extent of their capacity, to answer strictly for the property entrusted to their care, to diligently transport and safely deliver, and they were bound to serve for a reasonable compensation. The customary price of like service was deemed to be the reasonable charge, and refusal to accept such rate, or the exaction of more, gave a cause of action for damages, or to recover back the amount of the charge in excess of the customary price or reasonable rate.

In an action at common law to recover an excess charge exacted by one engaged in a public service, no one ever knew of an inquiry as to the total profits of the party making the charge, or of a comparison of such profits with the value of his property employed to

render the service, but the inquiry was to ascertain whether the particular charge was a reasonable exaction for the service.

Doubtless, it is because of the frequency of confiscation cases—in which the value of the property has been brought forward in support of the claim that legislative authority transgressed the limits of its power as fixed by the Constitution—that superficial opinion has grown up to the effect that rates are made or based upon value.

By far the most important undertaking in the work of valuation is the Federal Valuation of Railroads now going on under an Act of Congress approved March 1, 1913. The reasons for, and scope of, that Act is of interest to everyone interested in railway problems. The value required to be ascertained is not for any particular purpose, though it may become involved in rate making, in rate judging, in taxation, in accounting, in capitalization, in public purchase, in sale of securities, and it may be used as a guide to future legislation.

The title of the Act shows that it is the purpose of the law to cause a "valuation" of the several classes of property of carriers. Value in its broadest sense is required to be found.

At the time of the passage of the law, important rate cases were pending in the Supreme Court of the United States and the valuation approved by the lower courts in some of these cases was being publicly discussed with such interest, and inasmuch as the fundamental principles controlling valuation were not finally settled, Congress required the Interstate Commerce Commission, not only to ascertain value, but also to report in detail the facts necessary to apply various principles and theories of valuation then being contended for.

LESS THAN REAL VALUE.

To illustrate the issues then pending, we call to mind the fact that attorneys, economists and appraisers assuming to speak for the public, vigorously contended for principles and methods of valuation of railroad property calculated to produce results much below real value.

They have contended:

(a) That a railroad company is not entitled to increments of value of any part or element of a railroad—land, embankments or anything else—due to the enhancement of market price, or to improvement by lapse of time;

(b) That a railroad company is not entitled to a return upon the value of property acquired by the use of money given to it in aid of the enterprise, and is not entitled to any return upon property granted or donated to it as an inducement to build the railroad;

(c) That a railroad company is not entitled to any return upon property paid for out of surplus earnings:

(d) That in rate cases the cost of the railroad property is the measure of value and constitutes the base upon which the company is entitled to a return;

(e) That the value of the physical elements (excluding value arising from franchises, contract rights, etc., which were acquired without cost), is the maximum upon which a railroad company is entitled to a return, and that the value of such physical elements is measured by the cost of reproduction less depreciation;

(f) That railroad property is not in reality private property, but that it is held by the owner as trustee for the benefit of the public.

Notwithstanding that each of these propositions is without support in the decisions of the courts, they are still being urged in controversies concerning the reasonableness of rates, and undoubtedly these, and other claims having like purposes, will be urged upon the Interstate Commerce Commission as proper guides for the valuation of railroad property required by the Act.

The passage of the Valuation Act was promoted to some extent at least by those who favor such propositions, and some of its requirements indicate that it was the purpose of Congress to provide not only for the determination of value, but also to require the ascertainment of many facts and much information having more or less relation thereto for the purpose of disclosing the methods by which the value was ascertained, and to provide data for the application of whatever rules or principles of valuation might finally be adopted.

It is clear that the Federal Valuation Act does not contemplate that the Interstate Commerce Commission, or any of the State Commissions, shall make rates based upon that value.

As above pointed out, the value of railroad property may be used to ascertain whether or not the general level of rate schedules is too high or too low, and may be used in confiscation cases to determine whether legislative rates violate the Constitution. To this extent value of railroad property may be involved in or related to the regulation of rates.

SAME PRINCIPLES GOVERN.

Clearly the same principles govern valuation of railroad property for the purpose of rate regulation as apply in the case of condemnation of private property for public use.

A few years ago the statement of that proposition would have been universally accepted not only as the settled law but also as so

manifestly just and reasonable as to require no support by the citation of authority, or the statement of the reasons upon which it rests. Recently, however, as above indicated, the value of railroad property has been attacked in the field of public discussion and in the courts, and men of prominence propose definitions of value which lead directly to the conclusion that legislative authority may be arbitrarily exercised in prescribing railroad rates and charges. In other words, the various conceptions and definitions of value being put forward as sound, will, if accepted, set at naught the Fifth and Fourteenth Amendments, protecting private property against seizure for public use without just compensation. A mere moral obligation to be "fair" or "just," or to seek an "equitable conclusion" would be substituted for our most important constitutional provisions. Notwithstanding governmental power to regulate its use, railroad property is private property and its owner is entitled to compensation for its use in the public service, and to have and enjoy whatever profit can be secured by the application of a just and reasonable schedule of rates, and no power may justly require the use of such property without reasonable reward. It is familiar law that the Constitution protects the owner in the right, which legislative authority cannot take away, to earn a reasonable rate of return upon full value of the property used, as that value is at the time that it is used in the public service, subject only to the limitation that rates shall not be extortionate or excessive.

Railroad business is subject to many risks and hazards. No one gives assurance that there will be any net earnings or that property invested in the enterprise will not be lost. If the owner of railroad property makes a mistake, he alone must bear the consequences and justice requires that if he builds wisely his intelligence and enterprise should be rewarded.

Admitting the power so to do, it would not be just to reduce rates below what is reasonable merely because the profits of the company are large. A railroad may be so fortunately circumstanced that it can earn large profits at reasonable or even low rates. It is only when railroad property is well located, built to meet a reasonable demand for its service, intelligently planned, economically constructed, maintained and operated, that its owner is, as a matter of constitutional right, entitled to a reasonable rate of return upon the value of such property. But will it not be conceded that the mere existence of legislative power to reduce rates does not justify the exercise of that power?

Should all the rewards which are due to foresight, wisdom and enterprise of the men who conceived and constructed wisely be transferred by legislative authority to others?

The substitution of cost for value and the making of rates on that basis would unjustly deny reward and profit to the owners of the best railroads of the country and amount to seizure of the use of private property without just compensation.

It may be worth while very briefly to call attention to some of the reasons why no such thing can be done.

In case of the taking of private property for public use by the exercise of the power of eminent domain, it is conceded by everyone that the owner of the property taken is entitled to the full market value thereof, and, as a part of his compensation, he is also entitled to the damages proximately resulting to his other property. It will not be claimed that legislative authority has any power to prescribe the amount of compensation to be paid for property so taken, and it is well understood that all the elements of value existing at the time of the taking must be ascertained and paid for.

The Fifth Amendment to the Constitution of the United States contains language as follows:

Nor shall private property be taken for public use, without just compensation.

The Fourteenth Amendment contains the following:

Nor shall any state deprive any person of life, liberty or property, without due process of law; nor deny to any person within its jurisdiction the equal protection of the laws.

COMPENSATION FOR PROPERTY.

The Fifth Amendment is a limitation upon the power of Congress and its equivalent is found in all state constitutions. It prevents the seizure or condemnation of private property without just compensation; under it, Congress has no power to make and enforce railroad rates so unreasonable and low as not to yield a fair return upon the full value of the property. Thus the very same words of the Constitution prohibit confiscation by rate making as prohibit the actual seizure of property for public use without just compensation.

The above provision of the Fourteenth Amendment prohibits confiscation by state-made rates.

These constitutional provisions have been held applicable in rate cases by the Supreme Court on many occasions during the last quarter of a century.

In rate cases, as well as in condemnation cases, all values and elements of value must be taken into account and included.

The suggestion that there exists, between the public and each railroad carrier, the relation of principal and agent, or beneficiary and trustee, is without foundation. The public does not owe the company the money that it has invested in the railroad property; if a loss or profit results from the conduct of the enterprise it must be borne by, or belongs to, the carrier, and the public, having no obligation to reimburse in case of failure, may not appropriate the rewards of success. The title to railroad property is not held either in whole or in part for the use or benefit of the public. The company has the full title and ownership.

By repeated decisions of the Supreme Court of the United States it has been held that railroads are the private property of their owners; that while, from the character of the work in which they are engaged, public authority has power to regulate the use of the property in certain particulars, it is in no sense the owner of the property or any interest therein, and that, subject to the limitations that charges shall not be unjust or unreasonable, and that they shall not discriminate, railroad companies are free to manage their important interests as those engaged in other callings.

From the very beginning of the exercise of the power of the states to prescribe the charges of those engaged in public callings, it has been held to be within the scope of judicial power, and a part of judicial duty, to restrain, and set aside, any measure which operates to deny to the owners of property used that equal protection which is the constitutional right of all owners of other property, and that, in such matters, the limitation upon the power of states prescribed by the Fourteenth Amendment is the equivalent of that upon the power of Congress prescribed by the Fifth Amendment, and that these constitutional provisions forbid legislation, in whatever form it may be enacted, by which the property of one individual is, without compensation, wrested from him for the benefit of another or the public. In one case the Supreme Court said:

This, as has been often observed is a government of law, and not a government of men, and it must never be forgotten that under such a government, with its constitutional limitations and guarantees, the forms of law and the machinery of government, with all their reach and power, must in their actual workings stop on the hither side of the unnecessary and uncompensated taking or destruction of any private property, legally acquired and legally held.

A MERE REGULATION.

In answer to the suggestion that the prescribing of rates is a mere regulation and not the taking of property it was said:

The equal protection of the laws—the spirit of common justice—forbids that one class should by law be compelled to suffer loss that others may make gain. If the state were to seek to acquire the title to these roads, under its power of eminent domain, is there any doubt that constitutional provisions would require the payment to the corporation of just compensation, that compensation being the value of the property as it stood in the markets of the world, and not as prescribed by an act of the legislature? Is it any less a departure from the obligations of justice to seek to take not the title, but the use for the public benefit at less than its market value?

Again it was said:

Property invested in railroads is as much protected from public appropriation as any other. If taken for public uses, its value must be paid for. Constitutional guarantees, to this extent, are explicit; and in such condemnation proceedings no inquiry is permitted as to how the owners have acquired the property, provided only it be legally held by them. If a farm belongs to an individual, and the public seeks to take it, it must pay its value, and is not permitted to diminish the price by proving the owner acquired the means of purchase by immoral or disreputable practices. He may have made his fortune dealing in slaves, as a lobbyist, or in any other way obnoxious to public condemnation; but, if he has acquired the legal title to the property, he is protected in its possession, and cannot be disturbed until the receipt of its actual cash value. The same rule controls if railroad property is sought to be appropriated. No inquiry is open as to whether the owner has received gifts from state or individuals, or whether he has, as owner, managed the property well or ill, or so as to acquire a large fortune therefrom. It is enough that he owns the property—has the legal title; and, so owning, he must be paid the actual value of that property. If he has done any wrong in acquiring or using the property, that wrong must be redressed in a direct action therefor, and cannot be made a factor in condemnation proceedings.

These propositions in respect to condemnation proceedings are so well settled that no one ever questions them. The same general ideas must enter into and control legislation of the kind before us. The value of the property cannot be destroyed by legislation depriving the owner of adequate compensation.

* * * * *

Now, if the public was seeking to take title to the railroad by condemnation, the present value of the property, and not the cost, is that which (it) would have to pay.

The language above quoted is that of Mr. Justice Brewer in decisions handed down in 1894. Since then the same doctrine has been applied by the Supreme Court of the United States over and over again.

In the Minnesota Rate cases counsel for the State directly urged:

(a) Where right of way has been donated free of cost it should not be included in the aggregate amount upon which to base a return; (b) that the land secured under the right of eminent domain should never be valued at more than original cost, and also in effect; (3) that additions or extensions paid for out of earnings should not be included in the value of the property.

The court decided the case June 9, 1913, and made this very definite statement:

It is clear that in ascertaining the present value we are not limited to the consideration of the amount of the actual investment. If that has been reckless or improvident, losses may be sustained which the community does not underwrite. As the company may not be protected in its actual investment, if the value of its property be plainly less, so the making of a just return for the use of the property involves the recognition of its fair value if it be more than its cost. The property is held in private ownership and it is that property, and not the original cost of it, of which the owner may not be deprived without due process of law.

MEANING OF WORD VALUE.

Some who encourage constant and frequent rate reductions through the exercise of legislative power, suggest that the court has not meant what it said; that the word "value" as used in a long and unbroken line of decisions was intended to mean something else—something less—and they call attention to the expressions "fair value," "reasonable value," and the like in support of that idea. Their thought seems to be that it would be "fair" and "reasonable" to take private property—in the use of which the public generally has an interest—from the owners thereof, if it cost less than its present value, or if it was paid for in whole or in part out of earnings that might have been divided among the stockholders in the enterprise.

It is certain that these phrases were never intended to be so used or understood. It might with equal reason be said that the phrase "just compensation," as used in the Fifth Amendment, which has come down to us from Magna Charta, does not mean compensation, including the value of the property taken and the damages resulting from the taking; that in case of government grants of lands to settlers, free or for a small consideration, it would be "just" under the Constitution to permit it to be taken for a postoffice site at what it cost the owner, or at what it cost less the value of its use while he had it, because he always held it subject to be taken for public use upon payment, not of "compensation," but of "just compensation." But as against contentions of like character it is well established that the word "just" is used evidently to intensify the meaning of the word "compensation," to convey the idea that the equivalent to be rendered for property taken shall be real, substantial, full and ample; and that no legislature can diminish by one jot this rotund expression of the Constitution.

It must be considered as established by highest authority beyond doubt in confiscation cases that the value of the property must be

taken as it is at the time it is being used to perform the service covered by the rates in question, and that the rate schedules cannot be reduced by legislative authority below what is sufficient to permit the earning of a full and fair rate of return upon that value.

It is also true that a rate which is merely high enough to be adjudged nonconfiscatory when attacked in judicial proceedings may be much below what is reasonable and just under all the circumstances.

Many considerations suggest the wisdom and justice of allowing railway carriers liberal and generous rates. In territories that are not fully developed much uncertainty as to the volume and constancy of the flow of traffic exists; it is always desirable that railway companies be able and ready to meet the maximum demand, and, therefore, much larger investment in land, structures, and equipment is required in the case of irregular business moving fitfully than would be required if the same moved with regularity; in all parts of the country increasing demands for service require expensive improvements and extensions; the money required to pay for them must be secured from the sale of bonds or stock subscriptions; it is manifest that if the margin of safety is small rates of interest and discount upon bonds will be high, and that new stock will not be subscribed for at par, unless present outstanding stock is worth something more than par and reasonable dividends on the total are quite certain to be paid; a very large volume of securities against the railroad properties of this country are held as investments for trust funds and the savings of the people; confidence and credit cannot be established or maintained unless present and prospective earnings are sufficient to leave a substantial surplus in good times that default may not occur in periods of depression; sound policy requires that the well located and economically managed railroads of the country be allowed a schedule of rates sufficient to produce a surplus to pay for non-revenue producing improvements—such as attractive passenger stations and grounds provided, not as necessary facilities, but to keep step and correspond with the advancing tastes and ambitions of every growing city; the elimination of crossings at grade in the interest of safety; the lessening of noise and smoke in the interest of public health and comfort, and many other things of similar character. Railway owners and managers are, as a general rule, in full sympathy with all reasonable demands of the public in these matters and respond to them to the extent of their ability, but it is plain that, if additional

securities must be issued to make improvements of this class, the margin of safety will grow less all the time, and fixed charges constantly advancing will impair the credit of securities as investments.

NEED OF GENEROUS ALLOWANCES.

Current statistics and a multitude of facts which are generally known to those interested in railroads might be brought forward to illustrate and emphasize the necessity of rate allowances generously above what is required to pay a fair rate of interest on the present value of the property. The policy should be to strengthen and not to strain credit; sparingly to issue additional securities in order that the same may be salable at desirable rates, and that those, which have been legitimately issued and now in the hands of the public, may be strengthened and made perfectly safe.

As value is not to be arrived at by rules or formulæ, but in the exercise of sound judgment formed in the light of all the facts, it is obvious that only men of experience, intelligence, and perfect fairness are qualified to do this work well.

It is difficult to think of a calamity so great as that which is certain to follow a valuation based upon the theory that the Federal Constitution does not protect the full present value of railroad property in rate regulation, and that individual conceptions of right and wrong may be substituted for fundamental principles of organic law.

Proper valuation of the railroads will furnish a guide which may be used to ascertain the reasonableness of the general level of rates in broad areas, and to support appropriate readjustments thereof. If, by means of it, a better public sentiment will be created—and it is thought that this will result if the work be well done—so that the carriers will be permitted to have rates which are justified by an enlightened and sound public policy, the enormous expenditures now being made by the government, and by the carriers, will be fully warranted.

The reasonableness of the rate of return to be allowed on present value is of great importance. While that question is not directly involved in valuation it is so closely related to regulation that a few words here with reference to it will not be out of place.

While the determination of what is a reasonable rate of return cannot be made with accuracy, but is a matter for judgment based on all the circumstances, certain considerations are recognized as having a definite bearing upon the matter. It is impossible that rates on different roads in the same general territory should vary

widely; each must meet the rates of the others, and rates that will permit a generous return upon the value of one may be ruinous to another, therefore it is impossible that rates of return upon different properties shall be the same, or even approximately so.

The most favored road must be allowed a generously high return, or many others will fail. The circumstances of all in the same general territory must be taken into account. Few roads, if any, will be found which may be destroyed without great injury to the public and, assuming that the existence of a railroad property is desirable or justified at all, it is surely entitled to earn—if it can do so at rates which are not per se extortionate—a rate of return upon the full present value of its property at least as high as the legal rate of interest. This being so, it necessarily follows that the strong lines must have a rate of return considerably higher than that.

In recent periods the net earnings on capital and surplus of national banks averaged from $8\frac{1}{2}$ to 10 per cent per annum. It is a general rule that, other things being equal, the rates demanded for investments are greater where risk and uncertainty are greater. It probably will not be suggested by anyone that the risk attending the business of national banks is as great as that attending railroad business. The bank selects its borrowers and securities, and may, if business becomes unprofitable, withdraw from it and invest its money elsewhere; its return is regular and certain; it is paid for the use of capital alone, and no considerable element of labor or management enters into the production of the result.

It is manifest that new capital will not seek railroad investment, if it be prohibited from earning therein as much as is generally earned in other large enterprises where the danger of loss, or of no return, or of irregular return, is no greater than in the railroad business, and if new capital cannot be secured to furnish additional mileage and facilities the result to all concerned will be serious.

While it is undoubtedly true that money invested in railroads generally has not in the past yielded as high a rate of return as other large investments, yet, until recent years, the prospect of increasing returns with the development of the country and the rise in the market value of railroad securities, operated as an inducement to attract capital to the railroads. Of late years, however, conditions have not invited, but have repelled, such investments and, therefore, the return, to be reasonable, must be higher and more certain than it has been recently or is at present.

THREE ILLUSTRATIONS OF RIGHT OF WAY VALUATIONS

GENERAL SECRETARY THOMAS W. HULME, OF THE PRESIDENT'S CONFERENCE COMMITTEE ON FEDERAL VALUATION OF RAILROADS, HAS SENT OUT THESE THREE ILLUSTRATIONS OF RIGHT OF WAY VALUATIONS UNDER VERY DIFFERENT CONDITIONS.

WHERE THE LAND OWNERS WANT THE RAILROAD.

No. 1. Report on the acquisition of right of way for the Knife River Branch of the Northern Pacific Railway Company, prepared in accordance with Land Circular dated October 30, 1914, for use in connection with the Federal Valuation.

The Knife River Branch is 68 miles in length and is located in Western North Dakota in the valleys of Knife River and Spring Creek and is an extension from Stanton westerly of an existing branch of the Northern Pacific Railway Company. It was constructed into a district greatly in need of railroad transportation, the wagon haul to the nearest railroad, theretofore, averaging about 30 miles. For this reason there was a general disposition shown by the land owners to treat the railway company fairly in the matter of prices for the right of way, and condemnation was not necessary except in some friendly suits on account of title complications.

An effort was made to determine the naked land value by the assessment method, but it was found impossible to do so with sufficient accuracy for the purpose, for the reason that many of the tracts had not been assessed on account of the title being still in the United States, the homestead entry not having been completed; also all of the assessment records of Dunn County had been burned in a fire which destroyed the County Court House and all the county records; also it was found difficult to determine accurately the ratio of assessed value to full value. For these reasons the effort was abandoned, and it was concluded to determine naked land value by the Opinion Method only.

H. J. Travis, the right of way agent, specially employed for the purpose of acquiring this right of way, certified as follows:

"I was employed by the Northern Pacific Railway Company as Right of Way Agent to purchase the right of way for its Knife River Branch extending from Stanton to Killdeer, a distance of 68

miles; that I had previously been employed by said company in a similar capacity to acquire other rights of way. I have lived in Western North Dakota for 28 years and am quite familiar with land values in that entire territory. I examined personally every tract of land crossed by the Knife River Branch; conducted practically all of the negotiations for the acquisition of the right of way; have interviewed a number of bankers and real estate dealers familiar with land values in that district and from the knowledge thus obtained I have prepared a statement setting forth in my best judgment the fair, reasonable value at the time of acquisition of the naked land for agricultural purposes of each parcel of right of way purchased for said branch. Form "A," to which this certificate is attached, shows said valuation on each tract and shows that the average of such value per acre in Mercer County was \$22.07 and in Dunn County \$22.13 per acre, and for the entire branch \$22.09 per acre.

The difference between the naked land value as set forth on said Form "A" and the purchase price is the amount allowed in each settlement for the severance and other damages, and in a few cases for cost of moving buildings off the right of way strip.

I further certify that the land owners in the district were very anxious to have the railroad constructed and there was a general disposition to ask prices that were reasonable. There was no difficulty in agreeing with the land owners as to the value of the naked land, but there were occasional differences of opinion between the land owners and myself as to the amount to which they were entitled for damages, but these differences were not serious and an agreement was reached in each case without condemnation."

From the data given on Form "A," the following sub-division of the total purchase price is made:

		Per Cent
Total naked land value.....	\$27,774.54	62.32
All other elements of value.....	16,791.89	37.68
Total Purchase Price.....	\$44,566.43	100.00
Expense of acquisition.....	9,258.79	
Per cent expense of acquisition to total purchase price..	20.77	

VALUATION WITHIN CITY LIMITS OF ST. PAUL.

No. 2. Report of Terminal Property acquired for a passenger coach yard at St. Paul, Minnesota, by the Northern Pacific Railway Company.

The property is within the corporate limits of St. Paul and about 3,500 feet distant from the Union Depot; it lies between the Mississippi River and the Bluffs which mark the limits of the valley; the entire area between the Bluffs and the River is owned by various railway companies. Originally the ground was quite marshy, but some of it had been filled in at time of purchase, and all of it when filled will be exceptionally adapted for railway purposes. At the time purchases were commenced there was located upon the tract the plant of the Standard Oil Company, the plant of the Pintsch Gas Company, two large storage warehouses and 26 dwelling houses ranging in value from \$50 to \$3,000.

The Company having anticipated its requirements sufficiently in advance, there was ample time to acquire the property without the haste which always increases prices, and was able to purchase over one-half of the area before it became known that it was the purchaser. Although prices kept advancing as each additional purchase was made, they never reached the point at which condemnation was deemed advisable. There was no severance damages as the entire ownership was purchased in each case.

One of the functions prescribed by law of the Tax Commission of the State of Minnesota is to determine the ratio of assessed value to actual value. The following is a copy of a letter from the Commission giving the ratio in the City of St. Paul for each of the different years in which the property covered by this report was purchased, and which ratios have been used on Form "B" attached to determine naked land values.

"Minnesota Tax Commission,
State Capitol, St. Paul, Minn.,
Nov. 6, 1914.

Mr. M. T. Sanders,
Tax Commissioner, Northern Pacific R. R. Co.,
St. Paul, Minnesota.

Dear Sir:—

In reply to your request of the 5th instant.

From the tabulation of real estate sales for the years 1902 to 1913 inclusive in the City of St. Paul, it appears that the ratio of assessment of the real property of the city to true value is as follows:

Sales of 1902 to 1907	57.55 %
" " 1908 & 1909—Assessment 1908	50.40 %
" " 1910 & 1911 " 1910	49.95 %
" " 1912 & 1913 " 1912	47.51 %

Yours very truly,

MINNESOTA TAX COMMISSION,

H. B. Bacon, Chief Clerk."

There had been no sales of any of the property acquired for many years prior to its acquisition by the Railway Company, nor of property in the vicinity of similar character and value, therefore there was but little data on which opinions of value could be based, for which reason the opinion method was not resorted to.

The Company is able from its records to determine with approximate accuracy the amounts included in the price of the various purchases for improvements on such of the property as was improved, segregated as follows:

Before identity of purchaser was known.....	\$11,083.33
After identity of purchaser was known.....	69,131.99
Paid Standard Oil Co. and Pintsch Gas Co., cost of moving.....	47,808.15
Total paid for improvements.....	<u>\$128,023.47</u>

COMPARISON OF PRICES BEFORE AND AFTER IDENTITY OF PURCHASER KNOWN.

BEFORE.

Area purchased.....	581,120 square feet
Total purchase price.....	\$94,000.00
Deduct amount paid for improvements.....	11,083.33

Amount paid for land.....	\$82,916.67
Price per square foot without improvements.....	\$ 0.143
Total naked land value determined by assessment method.....	44,535.00
Naked land value determined by assessment method per square foot	0.077

AFTER.

Area purchased.....	358,931 square feet
Total purchase price.....	\$269,700.00
Deduct amount paid for improvements.....	69,131.99

Amount paid for land.....	\$200,568.01
Price per square foot without improvements.....	\$ 0.558
Total naked land value determined by assessment method.....	49,536.00
Naked land value determined by assessment method per square foot	0.138

It will be observed from the figures given above that before it was known that a railway company was acquiring the property, the price per square foot paid for the land was about twice the naked land value determined by the assessment method, but after the purchaser became known, the elements of higher value for railway purposes and higher price because of the compulsory character of the transaction entered increasing the prices, so that the company paid for the land acquired after its identity was known, four times the naked land value determined by the assessment method.

From the data set forth above and on Form "B" attached, the following sub-division of the total purchase price is made:

		Per Cent
Naked land value determined by assessment method.....	\$ 94,071.00	23
Paid for improvements.....	128,023.47	31
Paid account higher value for railway purposes and compulsory character of transaction.....	189,413.66	46
Paid for severance or other damages.....	Nothing	
Total purchase price.....	\$411,508.13	100
Expenses of acquisition (Form C attached).....	\$ 3,553.20	
Per cent expense of acquisition to total purchase price.....		0.86

VALUATION IN A RICH IRRIGATED VALLEY.

No. 3. Report of acquisition of right of way for the Bear Creek Branch of the Northern Pacific Railway Company.

The Bear Creek Branch is located in Eastern Montana in the valley of the Clarks Fork of the Yellowstone River and the Valley of Bear Creek, and is an extension from Bridger southerly of an existing branch of the Northern Pacific Railway Company.

The branch parallels for its entire distance the Montana, Wyoming & Southern Railway and at no point are the two lines over two miles apart. Both valleys are narrow and that of the Clarks Fork is in a high state of irrigated cultivation. The farms being small the severance damage was heavy; a number of buildings had to be moved; irrigation systems changed to meet the changed conditions; and the expense of irrigation increased perpetually because of the severance. The district being already served by a railroad, the new line was looked upon by the farmers as a nuisance rather than a benefit.

In acquiring the right of way the Company agreed to conduct irrigation water across the right of way and road bed by siphons, and otherwise, also provide private crossings in a number of cases. This and other similar items will involve a considerable expense to the Company, in addition to the consideration paid, but as the railroad has not yet been constructed the amount of the expense cannot be determined.

For the reasons stated the acquisition of this right of way was difficult and without any favoring circumstances.

The assessment on the area of which the right of way formed a part is copied from the official assessment roll; the ratio of the assessed value to actual value is stated by the County Assessor William

Nelson to have been 25% in the years 1913 and 1914; to test the accuracy of the Assessor's statement an examination was made of all the sales recorded in the years 1913 and 1914 in which the true consideration appeared to have been stated in the deeds; there were 37 of these cases covering 5,916 acres sold for a total consideration of \$179,350, an average of \$30.31 per acre; the 5,916 acres were assessed for \$45,471, an average of \$7.68 per acre, showing a ratio of assessed value to sales consideration of 25.3%, which apparently confirms the Assessor's statement.

But an analysis of the sales indicated clearly that while all the lands in the county were assessed at approximately 25% of actual value, that the ratio on the more valuable lands was less than 25% and higher than 25% on the poorer lands; it was finally concluded after checking a number of sales in the two districts that a ratio of 20% was proper to apply in the district from Bridger to Belfry and 25% in the district from Belfry to Bear Creek. This produces naked land value as follows:

Bridger to Belfry	\$58.05 per acre (20% basis)
Belfry to Bear Creek.....	25.30 per acre (25% basis)

As shown on Form "B," nine of the tracts across which right of way was purchased did not appear on the assessment rolls for the year in which the purchases were made. For the present purpose it is assumed (and the assumption is warranted by the facts) that had these tracts been assessed, their inclusion would not have materially changed the naked land value produced from the assessment of the tracts that were assessed.

Attached hereto are copies of letters from the following parties, giving their opinions on land values in the district through which the right of way was acquired:

J. W. Chapman, of Meyer & Chapman, Bankers, Red Lodge, Montana.

J. H. Wright, Cashier, the Clark Wright Company, Bankers, Bear Creek, Montana.

J. F. Trumbo, Cashier, Farmers State Bank, Bridger, Montana.

J. O. Higham, Cashier, Bank of Belfry, Belfry, Montana.

As a general proposition it is believed that local country bankers are the best qualified experts that can be found on land values in the district in which they are located; handling farm loans is a large part of their business and they necessarily must study and keep in touch with land values.

The opinion of the bankers which is on the value of the naked land for agricultural purposes, supports as closely as can be expected in work of this character, the results arrived at by the assessment method, as the following shows:

Expert	Bridger to Belfry (12 miles)	Belfry to Bear Creek (7 miles)
	Per acre	Per acre
Chapman	\$60.	\$25.
Wright		20.
Trumbo	65.	35.
Higham	60.	20.
Average	\$61.66	\$25.00
Assessment Method	58.05	25.30
Average of the two methods.....	\$59.85	\$25.15

Condemnation was resorted to in the seven cases indicated on Form "B." The amount awarded by the Condemnation Commissioners was divided in their report to the Court in each case into two parts, to-wit: "Actual Value of strip appropriated including growing crops" and "Damage accruing to remainder." The following is a summary of the awards made in the seven cases:

Area taken	23.57 acres
Award for strips taken including growing crops.....	\$ 3,624.00
Award for damage accruing to remainder.....	23,930.00
Total award	27,554.00

Total prices asked before condemnation.....	\$32,000.00
Amount estimated by Right of Way Agents that owners were entitled to, based upon what had been paid to other owners with whom settlement had been made.....	\$17,500.00

It may be stated here that under the laws of Montana either party has the right of appeal from the award of Commissioners to a jury; the Company appealed in all seven cases, but becoming satisfied that there was no likelihood of a reduction, but rather a danger of an increase, the Company compromised the cases before the appeals were tried by dismissing the proceedings and taking deeds from the owners, paying them the amount of the awards, less reduction for the growing crops which it permitted the owners to remove. The reductions aggregated \$1,004.00, thus reducing the total paid from \$27,554.00 to \$26,550.00.

The naked land value of the seven tracts condemned, determined by the average of the assessment and opinion methods averaging \$59.85 per acre, the awards for the strips taken (naked land) with-

out including damages but including growing crops averaged \$153.75 per acre. If we assume that \$20 per acre, (which is liberal) was included for the growing crops, we find that the awards per acre exceeded the naked land value as determined by the assessment and opinion methods \$73.90 per acre. The results of the condemnation were quite unsatisfactory, the prices paid being much higher than in the cases settled without condemnation.

The branch runs through the town of Bear Creek which is a coal mining community of about 1,000 inhabitants. The Company acquired lots and portions of lots equalling in area about 59 full lots 25x120 feet, paying therefore \$18,250. The purchase included 4 dwelling houses, which were afterwards sold together with the parts of lots on which they stood for \$2,750, reducing the total consideration to \$15,500. The naked land value of the 59 lots produced by the assessment method (25% ratio basis) is \$2,206.08, therefore the excess paid by the Company after deducting salvage, covering improvements, damages and other elements, was \$13,293.92.

From the data set forth above and on Form B attached, the following subdivision of the total purchase price is made:

Naked land value figured on the average of the assessment and opinion methods:		Per Cent
Bridger to Belfry 155.78 acres at \$59.85.....	\$ 9,323.43	
Belfry to Bear Creek 104.26 acres at \$25.15.....	2,622.14	
Bear Creek Town lots.....	2,206.08	
<hr/>		
Total Naked Land Value.....	\$ 14,151.65	12.33
All other elements of value.....	100,606.60	87.67
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Total purchase price.....	\$114,758.25	100.00
Expense of Acquisition (Form C attached).....	\$ 5,384.35	
Per cent expense of acquisition to total purchase price....		4.7

METHODS OF RAILWAY TAXATION IN MICHIGAN

BY DAVID FRIDAY,

PROFESSOR OF POLITICAL ECONOMY AND FINANCE, UNIVERSITY
OF MICHIGAN.

There are at present three methods of taxing railroads in the United States that are worth discussing. They are the stock and bond method, the gross income method, and the ad valorem method. Michigan has tried all three and is at present operating under the third. From 1871 to 1901, it was operating under the second plan—that of taxing gross earnings. The great reduction of revenue from this tax consequent upon the reduction of income during the period of industrial depression following 1893 started agitation for railway tax reform. In 1897 the legislature imposed a scale of rates ranging from $2\frac{1}{2}$ per cent of gross earnings for roads with a comparatively small income, to 5 per cent as a maximum. The greatly increasing pressure with which the necessary expenditures for government bore upon the people led them to seek for new sources of revenue, and by 1898 it had become clear that the railway tax would be increased. In 1899, a tax commission was appointed to examine into the general tax situation of the state. After considerable agitation resulting in amendment of the state constitution, the present system of taxing railroads was established in 1901. It had for its fundamental idea, a uniformity of taxation for all species of property. The following sentence from Governor Pingree's special message became the cornerstone of the new tax structure: "There is but one rule (concerning taxation) consistent with honesty; that rule is to place all property upon the same footing."

The average receipts per annum from the railroads under the gross income tax during the period 1897-1901 had been \$1,210,129. The appraisal of the roads made by Professors Cooley and Adams had resulted in a valuation of \$202,212,919. This gave an actual tax rate of less than .6 of 1 per cent for the railroads. The rate for the general properties of the state had been \$22.24 on assessed value in 1899; \$16.33 in 1900; and \$17.49 in 1901. Although the impression prevailed very generally that this general property was under-assessed and that, therefore, the rate on actual value was not as high

as these figures would indicate, no one believed that such under-assessment was great enough to bring the rate that general property was paying below 1 per cent. The under-taxation of railroads seemed, therefore, established beyond possibility of dispute.

THE AD VALOREM METHOD OF ASSESSMENT.

The principal changes in the Michigan system which resulted from this agitation are the following:

(1) The substitution in 1901 of the taxation of the property of railroad, union station and depot, express, telegraph and telephone, sleeping car and car loaning companies, by a system of ad valorem assessment through a state board of assessors in the place of taxes imposed as theretofore at specific rate upon gross earnings. The rate paid by these properties is called the "average rate" and is determined by the simple arithmetic process of dividing the total assessment of general property into the taxes paid by such property.

(2) The creation of the state board of tax commissioners, by an amendment to the general tax laws of 1899, and the vesting in that board of the authority to review the assessments made by local assessors throughout the state, and to correct inequalities of assessment. Under the law as at first enacted the commission was given full authority and power of review, and during the few years from 1899 to 1905 that it was permitted to exercise those powers the assessments throughout the state increased materially and much omitted property was added to the rolls. In 1905, however, the authority for review by this board was somewhat restricted, and the work of bringing the assessments of the state to cash value remained practically at a standstill. In 1911, the same general powers of review and correction as originally conferred upon the board of state tax commissioners were restored to it.

We have, then, in Michigan a system in which the railroads are to pay the same rate as all other properties if justice is to obtain. The state board of tax commissioners is charged with the duty of bringing the actual situation into conformity with this ideal. Its powers would seem to be ample to secure the realization of the intent of the law.

What has been the result of twelve years of actual experience with the law? Have we realized in practice that ideal situation in which the railroads pay the same rate as the general properties throughout the state?

The first assessment of the railroads was made in 1902, and was evidently based quite directly upon the 1901 appraisal, varying from it by only \$3,500,000. The average rate for the year was \$16.55, and the yield of the new tax was \$3,288,162. The average receipts from railroads under the ad valorem assessment for the period 1902-1907 were \$3,463,809. This was 201 per cent of what the tax would have been for the same years under the gross income tax of 1897. Since 1909 the tax has averaged almost \$4,400,000. Tested by the criterion of productiveness the new tax has certainly been most successful.

RATE OF TAXATION INCREASED.

An examination of the average rate from 1902 to 1913 is interesting and instructive. Reference to the following table shows that the rate paid by the railroads increased steadily from \$16.55 in 1902 to \$18.01 in 1908. Since that time, it has risen with alarming rapidity, being \$20.67 in 1909 and \$21.56 in the current year.

TABLE 1—COMPARATIVE STATEMENT—ASSESSED VALUATION, TAXES LEVIED AND AVERAGE RATE OF TAXATION, 1901-1913.

Year	Total assessment	Total taxes	Average rate per \$1,000
1901.....	\$1,335,109,918	\$23,350,404.37	\$17.49
1902.....	1,418,251,858	23,476,733.55	16.55
1903.....	1,537,355,738	25,999,017.83	16.91
1904.....	1,529,969,350	25,891,584.01	16.92
1905.....	1,574,422,770	27,402,198.86	17.40
1906.....	1,598,935,606	26,330,650.07	16.47
1907.....	1,654,371,892	29,153,969.97	17.62
1908.....	1,648,671,411	29,689,332.26	18.01
1909.....	1,687,155,697	34,879,093.20	20.67
1910.....	1,739,652,478	35,710,509.65	20.53
1911.....	1,898,057,358	39,315,699.16	20.71
1912.....	2,078,694,409	43,242,968.04	20.80
1913.....	2,345,695,709	50,569,766.00	21.56

No one who is at all informed on matters of taxation in Michigan believes that the average rate represents accurately the tax burden on general property. This tantamount to say that the rate paid by railroads is too high if they are assessed at full value. "How much too high?" will at once be asked. A comparison of the tax burden borne by Michigan roads with the railroads of the United States as a whole will be instructive on this point. The table No. 2 presents a summary of the facts of railroad taxation in Michigan from 1902 to 1913.

It will be observed that the tax paid by the railroads during this period has been approximately 30 per cent of net earnings from operation, and 6 per cent of gross earnings.

MICHIGAN BASIS THREE TIMES AVERAGE FOR UNITED STATES.

The table No. 3 presents a summary of the ratio of taxes to net earnings from operation for all the railroads of the United States. This ratio is 10.3 per cent, as compared with the ratio of 30 per cent for Michigan. The Michigan railroads are paying three times as great a proportion of net earnings from operation in taxes as are the railroads of the United States, considered as a whole.

TABLE 2.

TABLE 2.				
Year ending June 30 (1)	Gross earnings from operation (2)	Operating expenses (3)	Net earnings from operation (4)	
1902.....	\$45,820,215	\$35,510,219	\$10,309,996	
1903.....	51,559,605	40,588,230	10,971,375	
1904.....	51,715,342	41,615,736	10,099,606	
1905.....	54,741,979	44,549,709	10,192,270	
1906.....	60,458,895	47,824,590	12,634,305	
1907.....	66,259,937	53,981,051	12,278,886	
1908.....	63,235,347	50,007,804	13,227,543	
1909.....	63,667,477	48,646,151	15,021,326	
1910.....	72,025,499	53,839,115	18,186,384	
1911.....	71,972,549	59,535,960	12,436,589	
1912.....	76,097,686	61,192,823	14,904,863	
		Per cent.	Per cent.	
Net earnings less taxes (5)	Assessed valuation (6)	Tax levied (7)	tax to gross (8)	tax to net (9)
\$8,826,090	\$198,641,000	\$3,288,162	7.17	31.90
7,683,213	222,106,000	3,756,149	7.28	34.24
6,343,457	196,795,000	3,330,350	6.44	32.97
6,861,920	202,651,000	3,527,059	6.44	34.60
9,107,246	207,068,000	3,409,915	5.64	26.99
8,868,971	207,130,500	3,650,132	5.51	29.75
9,577,411	207,305,000	3,713,155	5.87	28.07
11,288,171	211,764,500	4,377,871	6.88	29.14
13,808,513	211,716,000	4,346,841	6.03	23.90
8,089,748	211,075,500	4,372,145	6.07	35.16
10,532,718	210,884,500	4,387,019	5.76	29.44

TABLE 3—RAILWAYS IN THE UNITED STATES CONSIDERED AS A SYSTEM.

Year (1)	Total net revenue from operation (2)	Taxes (3)	Per cent. of taxes to total net revenue from operation (4)
1901.....	\$558,128,767	\$56,944,372	10.22
1902.....	610,131,520	54,465,437	8.92
1903.....	643,308,055	57,849,569	8.99
1904.....	636,277,838	61,696,354	9.69
1905.....	691,880,254	63,474,679	9.17
1906.....	788,887,896	74,785,615	9.47
1907.....	840,589,764	80,312,375	9.55
1908.....	724,258,113	84,555,146	11.67
1909.....	819,234,128	90,529,014	11.05
1910.....	928,037,002	103,795,701	11.18
1911.....	876,103,870	108,309,512	12.36
Total.....	\$8,116,837,207	\$836,717,774	10.30

Similar conclusions follow, if we examine the per cent of tax to net revenue from operation for the Michigan railroads as compared with the railroads of neighboring states. As shown by table 1 above, the ratio of taxes to net earnings from operation is 30 per cent. If we compare with this the ratio of taxes to earnings for the systems which operated partly in Michigan and partly in other states and in the Dominion of Canada during the period 1909-1911, we arrive at a percentage of 28.69 for the Michigan roads and a percentage of 13.59 for the entire systems. The detailed figures are set forth in the following table:

TABLE 4—ROADS OWNED AND OPERATED.

Michigan Section			
Year (1)	Total net revenue from operation (2)	Taxes (3)	Per cent. of taxes to total net revenue from operation (4)
1909.....	\$15,021,326	\$4,377,871	29.14
1910.....	18,186,384	4,346,841	23.90
1911.....	12,436,589	4,372,145	35.15
Total.....	\$45,644,299	\$13,096,857	28.69
Entire Lines			
Year (5)	Total net revenue from operation (6)	Taxes (7)	Per cent. of taxes to total net revenue from operation (8)
1909.....	\$91,238,505	\$11,732,060	12.85
1910.....	100,064,942	12,589,590	12.58
1911.....	85,607,463	13,262,067	15.49
Total.....	\$276,910,910	\$37,583,717	13.57
Year (1)	Per cent. of total net revenue from operation in Michigan to total net revenue of entire line (2)	Per cent. of Michigan taxes to total taxes (3)	
1909.....	16.47	37.31	
1910.....	18.14	34.52	
1911.....	14.52	32.96	

Putting it somewhat differently, the per cent of total net revenue from operation in Michigan to the total net revenue of the entire lines was 16.47, 18.14, 14.53 for the years 1909-1911, respectively. The percentage of Michigan taxes to total taxes for the same years was 37.31, 34.52, 32.96. The tax burden borne by the Michigan roads seems, then, to be approximately three times as heavy as it is for the roads of the United States as a whole, and more than twice as heavy as the tax burden borne by railroads in those states border-

ing upon Michigan and through which some of our larger systems operate. Another interesting comparison is that of the percentage of gross earnings paid in taxes by the Michigan roads with the percentage of gross earnings in some of the other states using the gross earnings method of taxation. The Michigan roads, under the present system, have paid about 6 per cent of their gross earnings in taxes. States like California and Minnesota have settled upon 4 per cent as an equitable tax upon gross earnings. Minnesota has recently raised this to 5 per cent. On this basis of comparison, the Michigan roads do not seem to be paying over 50 per cent more than the railroads in states having a gross earnings tax. But that this is not the case will be seen when we compare the ratio of operating expenses to gross earnings in Michigan with that in Minnesota for example. An examination of gross earnings and operating expenses of the roads operating in Minnesota shows that the ratio is approximately 67 per cent. In Michigan, it is 80 per cent. A payment of 6 per cent of gross earnings in Michigan, therefore, is a decidedly heavier burden on the roads than it would be in Minnesota; for not gross earnings, but net earnings, measure their taxpaying ability. Our railroads are, therefore, paying a higher rate upon gross earnings as well as upon net earnings than are the roads of most other states. Similar results are obtained by comparing the Michigan system with those other states having the ad valorem system of taxing railroads. In Wisconsin, the rate has remained quite constantly at a little over \$11 per thousand, while the Michigan rate has risen from \$16.55 to \$21.56.

Thus far the evidence that has been presented proves conclusively that the railroads of Michigan are bearing a heavier tax burden than either the railroads of the United States, taken as a whole, the railroads of the neighboring states, Wisconsin and Minnesota, or the railroads of the other neighboring states in which our Michigan roads are operating. Taken by itself, this would not necessarily signify very much with respect to the justice of the tax burden imposed upon railroads in Michigan, for the assumption is that all classes of property in the state should bear approximately the same burden, making allowance for difference in the local tax rate.

RAILROAD TAXATION HIGHER THAN THAT ON OTHER PROPERTY.

We must proceed, therefore, to compare the rate borne by railroads in Michigan with the rate borne by other property in the state. In the report of the State Board of Tax Commissioners to the State

Board of Equalizations in 1911, the assessed valuation of the state was given as \$1,739,652,458, and the average rate per \$1,000 as \$20.53. The valuation of the state by the State Tax Commission after careful examination and comparison of sales of property with assessments thereof was placed at \$2,963,553,882. Had assessments been made at the valuations found by the tax commission, the average rate would have been \$12.05. The ratio of assessed value to full value was 59 per cent. The correctness of these estimates by the commission has since been substantiated by reviews of various counties which have been made by them in which the estimates placed upon the counties reviewed were found to be substantially correct. This percentage has probably not changed materially; 65 per cent would certainly be the maximum that one could reasonably put as the ratio of assessment to actual value. Is railroad property assessed at a correspondingly low percentage of value? An examination of the net earnings less taxes for Michigan railroads for the five years 1908-12, inclusive, shows the average net earnings less taxes to have been \$10,659,312. Capitalized at 5 per cent, this gives the value of \$213,186,250, which is approximately the figure at which the railroads have been assessed in the last five years.

The conclusion would seem to be, therefore, that the railroads are assessed at approximately full value, while the remaining property of the state is assessed at not more than 65 per cent of such value. The only doubt that can arise here is concerning the rate of 5 per cent chosen for the purpose of capitalizing the net income. When one calls to mind the fact that Pennsylvania Railroad stock can be bought at a price that will yield a rate of 8 per cent in net income and of 5 per cent in cash dividends, this figure of 5 per cent seems by far too low. Six per cent or 8 per cent would seem to be more nearly correct. Surely 5 per cent is the lowest possible figure that could reasonably be chosen for a capitalization of these net earnings.

A similar conclusion with respect to the under assessment of general properties throughout the state is reached from an examination of separate classes of property. The electric railroads of the state, having five or more miles of interurban road, make annual reports to the state railroad commission. From this it appears that for the years 1908-13, inclusive, taxes paid were approximately 11 per cent of net earnings from operation—about one-third of the percentage paid by the steam railroads.

A suspicion of the existence of the situation here outlined led to the provision for a special commission of inquiry into taxation by the legislature of 1911. This commission was composed of Roger I. Wykes, an attorney of Grand Rapids, who has been prominently connected with the railroad tax and rate cases during the past decade; Professor Henry C. Adams of the University of Michigan, and Patrick H. Kelly, formerly lieutenant governor of the state, now congressman at large. The findings of this commission corroborated the conclusions here reached.

The method of procedure employed in the investigations was to examine the tax rate by industries. The conclusion reached, after careful examination, was that railroads were assessed at approximately cash value and that they were paying on that value \$20.67 per \$1,000—the average rate for 1911. Farms were paying about \$10 per \$1,000. This conclusion was reached on the basis of records of sales and assessments collected by the tax commission, in all the townships and counties in the state. City residences were paying at the rate of about \$15 per \$1,000. This rate was likewise computed from records of sales and assessments, which had been collected by the tax commission. Mines were paying about \$7 per \$1,000, as shown by an appraisal of the mining properties made for the tax commission by Mr. Finley in the same summer. Interurban railroads were paying about \$7 per \$1,000, and manufacturers were paying \$5.30 per \$1,000. The manufacturing corporations of Michigan reported to the Commissioner of Internal Revenue for the year 1909 \$66,000,000 as their net earnings after paying interest on bonds, taxes, depreciation and all other expenses. Out of this sum of net income they paid less than \$4,000,000 in taxes. The commission of inquiry capitalized their net income at 10 per cent and added the bonded indebtedness of the manufacturing corporations at par, thus arriving at a value of approximately \$750,000,000 for the manufactures. As stated above, on this value they paid a little less than \$4,000,000 in taxes. The generalization thus reached seemed so startling that further investigation was made of a considerable number of industrial corporations doing business in the state—a selected number for which market quotations on their stock were available show a stock and bond value of \$95,000,000. These corporations paid for the year 1910 \$334,210 in taxes, thus giving a rate of approximately \$3.50 per \$1,000. In Michigan all corporations are required to report their balance sheets containing their tangible prop-

erty only to the secretary of state. An examination of the property as reported by them and a comparison of the same with the taxes paid confirmed the commission in the correctness of its finding to the effect that \$5.30 was the average rate borne by industrial corporations.

It is not necessary to present further evidence. Railroads are overtaxed in Michigan. Thirteen railroads in our state have had a deficit for at least several years last past. Several are in the hands of receivers today, and there has been practically no extension of steam railroad lines in Michigan under the present system of taxation. Furthermore, there seems little doubt to anyone conversant with the situation that Michigan is confronted with the necessity of raising interstate rates for freight and passengers on many of its roads if the present tax rate is to continue.

THE CAUSES.

What is the cause of this situation and what are the remedies that could reasonably be expected to bring relief? The constitution of Michigan, since 1850, has provided that all property shall be assessed at full value. In addition to this, the state tax commission has full power to review of its own initiative the assessments of any local assessor. This power it exercised from 1899 to 1905, and from 1911 to the present time. Notwithstanding these provisions the tax rate has steadily risen from \$16.55 to \$21.56.

Our assessors are locally elected. The assessment of property is annual, and after practically each assessment the assessing officer comes before the local constituency for re-election. It is this attempt to assess all classes of property by a local officer, responsible only to a local constituency, that has without doubt been the cause of the present under-assessment of general properties in Michigan. All the prodding of the tax commission and the reviewing of the assessments by it seem not to have succeeded in raising the assessments to anything approaching cash value. When the state board of assessors was confronted with the problem of assessing the railroads, it availed itself of the services of expert engineers and statisticians to place a value upon this property. Manifestly, no one less adequately equipped was capable of performing this difficult task. Certain railroads have indulged in considerable criticism of the valuation so made, but the writer cannot escape the conviction that the valuation would have been quite adequate to meet the demands of justice if the average rate had been the true average rate and not one based upon assessed value.

There is nothing inherently vicious in the Michigan system of taxing railroads, either as regards the method in which value is determined, or as regards the theory of the average rate. The principal difficulty lies in the inadequate and ineffective administration of our local assessments by our locally elected officers. The gross under-assessment and consequent under-taxation of manufacturing corporations points to the principal weakness of the situation. The ordinary local officer lacks the capacity to value many classes of property within his jurisdiction. The appraisal of manufacturing plants and of public service property is a task calling for specially trained men and has given rise to a special profession; in Michigan, the local assessor is asked to make such a valuation, not only of tangible, but intangible property every 12 months. He is absolutely incapable of doing this work in a satisfactory manner. If he were capable of doing it, it is very doubtful, being locally elected, whether he would find it expedient to put the value upon the tax rolls. No authority short of a central body with adequate power to employ professional valuation men and with authority to demand access to accounts is capable of assessing this class of property. There is little hope of an assessment approximating full cash value until the powers of the tax commission shall have been extended to the point where it will have control of the appointment of the local assessor and of the methods and standards to be employed by him in appraising property.

PROPOSED REMEDIES.

In what direction shall we look for relief from the present situation in Michigan? We might, of course, go back to the old gross earnings tax at the old rate, but any gross earnings tax will produce some of the inequalities existing under the present system of taxation of railroads. No matter what the rate upon earnings may be, the road that has only gross earnings, but no net earnings, is burdened beyond its ability to pay, for such a road is of no value to any one except the community which it serves with transportation facilities. Even if we should go back to the old gross earnings tax, we would have no assurance that the rate would not be 6 or 7 per cent upon gross earnings, for this would be a specific tax, and a specific tax, in Michigan at least, need not bear any relation to any other tax in the system. In the event of a rate as high as 6 per cent, the railroads would have practically no relief.

A net earning tax, if it could be enacted, would probably solve the difficulty at a stroke. A 20 per cent tax on net earnings * would give substantial relief to the railroads of the state and would be so high that there would be practically no objection to the rate; especially since it is decidedly higher than the railroads of the United States pay upon the average. There is little likelihood, however, that the state legislature or the people of the state would consent to returning to a system which makes the basis of railroad taxation different from that of general taxation.

Another plan which has been proposed and which is being supported by the Michigan Tax Association, is that of limiting the rate which municipalities may levy for purposes of local taxation to 1 per cent.

There is one other hope for relief. The tax commission, as stated above, has unlimited power to review the assessments of the local officer of its own initiative. Having made such review, the value placed upon the property by the tax commission must stand for three years, during which time it may not be reduced without the permission of this board. This, I frankly believe, is the chief source from which relief must come for the railroads. The activity of the commission has resulted in an increase of \$500,000,000 in the last two years, and only the unprecedented rise in taxes of more than 28 per cent during the same interval has prevented a fall in the average rate. The commission is, at the present time, engaged in reviewing various counties. In addition to this, the tax commission has offered the services of its field men to local assessors and is attempting to aid them in improving their methods of assessment and bringing them to cash value.

The greatest relief may be expected from legislation, looking to the improvement and extension of the work of the tax commission. The tax commission should be given power, at least, to remove any local assessing officer who refuses to correct gross under-assessment when ordered to do so by the tax commission. The most desirable thing would be the abolition of the locally elected assessor and the substitution therefor of a man who is appointed by the tax commission after civil service examination. If this change in the administrative machinery for local tax administration could be effected, the valuation of the state would be at \$3,500,000,000 within two years, and the average rate would be correspondingly lowered.

*In 1914 the taxes of the railways of the United States amounted to 20.6 per cent of net earnings after paying operating expenses and taxes.

RAILROAD WAGES AND TAXATION

THE GROWTH OF TWO IMPORTANT FACTORS IN TRANSPORTATION COSTS OVER WHICH THE ROADS HAVE LITTLE CONTROL, AND WHICH CANNOT BE WHOLLY OFFSET BY GRANTING HIGHER RATES.

BY ROBERT LE C. HOVEY.

In the New York Times, Annalist.

Railroads of this country are confronted with economic problems, far-reaching in their effects, which threaten to still further narrow the already rapidly diminishing margin of operating profits. A great cry has gone up from the public charging the railroads with extortionate practices, but that public has never considered its unfair treatment of the railroads in countenancing the levy of exorbitant taxes, and the constant and unreasonable demands of all classes of railway employes for increased wage scales, even in the face of greatly reduced net income.

TAXES AND WAGES FIRST.

The first lien against a railroad company's revenues is wages, and no matter what the condition of business may be, funds must be provided to meet the payroll at regular periods. Moreover, there is no longer any argument as to what the amount of wages shall be; most of the employes are members of the labor unions, and when the men want an increase in wages, the unions demand it and usually get a part of their demands. The next lien on revenue, after wages, is taxes. As regards taxes, railway managements have no choice whatever.

What is to be done to remedy this condition of affairs? Some will say that the granting of additional freight rates will adjust the railroads' revenues to these ever-increasing demands. In a measure that is true. But the increase of freight rates must end somewhere, while the demands upon the railroads for increased wage scales and higher taxes are seemingly never-ending. Evidently the situation cannot be met by providing increased revenues alone, but by enforcing consistency upon the labor organizations, as well as the enactment of legislation which will result in a uniform and equitable method of taxing railroad properties of this country.

HIGHER RATES NOT A SOLUTION.

That the granting of increased freight rates will not permanently adjust the situation is clearly shown in the case of the railroads operating in Eastern classification territory. They were granted schedules of increased tariffs, which, it is conservatively estimated, will provide approximately \$25,000,000 per annum additional revenues. Judging from past experience, the additional revenue will not be sufficient even to meet the usual annual demands of increased wages and taxation.

To illustrate: During the five-year period 1908-1913 the average annual increase in wages was approximately \$67,000,000, and in taxes about \$9,200,000, making the total average annual increase in these two items \$77,000,000 for the railroads of the United States. As the roads of the Eastern district employ nearly half of the railroad forces, and pay almost 50 per cent of the railroad taxes of the country, it would appear that at least one-half of the average annual increment in wages and taxes, or \$38,000,000, should be properly assigned to that territory. Therefore, it is plain that, if the railroad wages and taxes continue to increase at the rate maintained during the last few years, the revenues to be derived from the recently increased freight rates will be about \$13,000,000 short of the amount required to meet the added burden. Moreover, there would be none of the additional revenues available to provide for the normal increment in other essential operating costs.

The up trend of railway wages during the twenty-year period 1893-1913 is indicated by the fact that the average wages for all employes rose from \$591 per annum in 1903 to \$757 in 1913.

FAVORED UNIONS.

From these figures it is plain that the major portion of the advance in wages was granted during the period 1903-1913, and that the enginemen, firemen, conductors, other trainmen, and shopmen have been the most favored in the extent of the increase, and it would appear that in most cases their present wages are at least adequate, considering the duties and responsibilities of the various services involved.

As a result of the fact that wages advanced in far greater proportion than gross revenues, the ratio of wages to gross revenues increased from 40.78 per cent to 44.05 per cent. In other words, railroads paid 44 cents of each dollar of revenue for wages in 1913,

as compared with nearly 41 cents in 1913. The constant wage scale advances, without regard to the growth of revenues, have greatly reduced the purchasing power of the railroads' revenue dollar. The extent of this decline in purchasing power, so far as it relates to labor, is indicated in the appended table:

	Number of Days' Services of Each Class of Em- ployes, Purchasable With Each \$100 of Revenue		Decline P. C.
	1903 (Days)	1913 (Days)	
General office clerks.....	45.2	39.8	11.9
Station agents.....	53.5	43.8	18.1
Tel. operators and dispatch.....	48.1	39.8	17.3
Enginemen	24.9	19.2	22.9
Firemen	43.9	31.9	27.3
Conductors	29.6	22.8	22.9
Other trainmen.....	46.1	32.9	28.6
Machinists	40.0	30.7	23.2
Carpenters	45.7	38.0	16.8
Other Shopmen.....	53.8	43.3	19.5
Section foremen.....	56.2	46.7	16.9
Section laborers.....	76.3	63.3	17.0
All employes (average).....	51.6	40.2	22.1

Another interesting phase of the wage question is that with the increased wages awarded to the various classes of employes, to recompense them for the added duties and responsibilities they were represented to have, the number of employes per 100 miles of line has increased from 515 in 1893 to 639 in 1903, and to 743 in 1913; the increase during the last decade being 16.3 per cent. This fact would seem to indicate that the service to be performed has increased out of all proportion with the capacity of the former number of employes. That condition doubtless existed as the traffic, both freight and passenger, expanded at an appreciable rate during the decade 1903-1913. Freight traffic density, representing the number of tons carried one mile, per mile of road, increased 45 per cent, while passenger traffic density, representing the number of passengers carried one mile, per mile of road, increased 38 per cent.

LOWER INDUSTRIAL WAGE.

According to statistics of the Census Bureau, the average wages of employes in industrial pursuits, which in many cases require far greater intelligence and special fitness as to skill than is demanded

of the average railway employe, have not advanced in as great proportion as those of railway employes since 1899. The comparative figures are here given:

	Average Per Diem Wages		Percentage of Excess of Railroad Over Indus- trial Wages
	All Industries	Rail- roads	
1909.....	\$2.01	\$2.44	21.9
1904.....	1.82	2.15	18.1
1899.....	1.63	1.92	17.8
Increase 1909 over 1899.....	23.3 %	27.1 %	

These figures, based upon the same average duration of employment each year, prove the point conclusively that the average railroad wages are considerably higher than the average wages of industrial workers, also that the margin of this excess in average railway wages showed a marked tendency to increase after 1899.

In support of the contention of the railroads that taxes are increasing at a prohibitive rate, these figures are convincing:

	Taxes Paid	Taxation Per Mile	Ratio of Taxes to Gross Revenues
1914.....	\$141,579,797	\$559	4.58
1913.....	129,581,478	532	4.09
1912.....	120,091,734	487	4.22
1911.....	108,219,512	445	3.88
1910.....	104,144,701	436	3.77
1909.....	89,026,226	382	3.74
1908.....	83,775,869	367	3.53
1907.....	80,312,375	353	3.10
1906.....	74,785,615	336	3.21
1905.....	63,474,679	292	3.04
1904.....	61,696,354	290	3.12
1894.....	38,125,274	211	3.56

In 20 years the absolute amount of taxation has increased 271 per cent, while taxation per mile of line has advanced 165 per cent, and the proportion of taxes to gross revenues has grown 28 per cent. It is also clear that taxes have increased during the last decade at a much greater rate than in the previous one.

Since 1889, or during the last quarter of a century, the railroads of this country have paid approximately \$1,685,000,000 in taxes, or

at the average rate of \$67,000,000 per annum. In that period the taxation per mile of line has increased from \$179 to \$599, or 212 per cent. Indeed, the proportion of taxes paid by the railroads has grown so rapidly in recent years that it is now generally conceded that they pay about one-eighth of the total taxes levied in the United States.

ASSESSED ON FULL VALUE.

According to Census Bureau statistics, the average tax levied throughout the country is 74 cents per \$100 of property valuations. Taking that figure as a basis, the taxes of \$559 per mile for the year ended June 30, 1914, would indicate that the railroads were assessed at a valuation of about \$75,500 per mile, or at an aggregate value of approximately \$19,100,000,000, which is nearly the amount of the total railway capitalization of the United States. In other words, the railroads are taxed at a 100 per cent valuation.

As to the justification for the increased railway taxation, it may be said that the cost of government of municipalities, counties, and states, has naturally advanced very appreciably in recent years, and that the railroads should rightfully be called upon for their share of the higher taxes. On the other hand, the railroads maintain with very acceptable evidence on their side that, with a few exceptions, the foreign corporations are made to bear more than their proportionate share of the increase, which causes railway taxes to be unduly high.

The situation is complicated by the lack of uniformity in the laws of the various states of the Union. As the railroads have extended their lines from state to state, and have become interstate corporations, the general property tax, as applied to individuals, has long since become inadequate as a method of railroad taxation, and has been generally supplanted by levies on capitalization, or on gross or net revenues.

AN EQUITABLE BASIS.

Net earnings would seem to be the natural basis for assessment, because they more equitably represent earning capacity, which should be the governing factor in fixing railway taxes. Moreover, there is a certain uniformity in the net earnings of all railroad properties of the country since standard accounting regulations have been prescribed by the Interstate Commerce Commission. These rules recognize the importance of depreciation charges as an operating ex-

pense, and thus make net earnings the income available for taxes and fixed charges. In England, France, Prussia, and other European countries that method of taxation is much in vogue.

The use of gross earnings as a basis for assessment, with graduated rates applied, in accordance with variation of operating costs, is favored in many states of the Union. This plan, however, has its distinct fallacies. Operating expense is a natural and constant lien upon gross earnings, and a tax levied on gross earnings is in effect one upon production. Such a tax is, according to the best authority, a violation of sound economic principles. Such a tax is in force in Oklahoma, and it has resulted in much litigation because of the prohibitive taxes which have been levied on the roads operating in that state.

RAILWAY MAIL PAY*

BY W. W. BALDWIN,

VICE-PRESIDENT CHICAGO, BURLINGTON & QUINCY R.R. CO.

I have just read in your issue of April 3 some comments regarding the bankruptcies of star route contractors in the Dakotas caused by parcels post, and the urgent necessity for a large increase in their compensation if these sparsely settled regions of the country are to have any mail service at all. All this was foreseen and was foretold as the inevitable outcome of the ill-considered parcels post legislation, inaugurated largely through the influence of mail-order houses, which are its chief beneficiaries.

In this connection you took occasion to make the following comment regarding the profit of the mail pay upon railroad mail routes where the traffic is heaviest:

As to whether the mail pay is adequate on the long, heavy runs between large cities, the answer, without doubt, is an emphatic "yes." But the railroads must carry the mail on thin routes as well as on the heavy. (Current Topics in Washington.)

Have you accurate and reliable knowledge as to the compensation received by those railroad companies which are carrying the mails over the long, heavy routes, between the large cities? Unless you have this information your views may be modified from a knowledge of the facts. It has, for some years, been my opinion, based upon investigation, that, in proportion to the value of the service, the railroads which carry the heaviest mails are the poorest paid. Several considerations enter into this question that are not generally known, three of which are important.

The first is the fact that under the law of Congress the application of the wholesale principle is so extreme that the railroads which carry the heaviest weight of mails are only paid, per ton per mile, one-twentieth of the rate that is allowed to roads which carry the lightest weights. The rate per 100 pounds on a small railway mail route is twenty times higher than the rate paid by the government on the heavy routes, owing to the sliding scale.

In the second place, practically all of the mail on heavy routes is carried in postoffice cars. In the freight and express service, increase of traffic results in so loading cars that the ratio of dead

*Letter to the Traffic World.

weight to paying freight is constantly decreased; to accomplish this result is one of the first laws in railroad economy. This economy is denied to the railroads in carrying the mails. Justice Moody, a member of the Wolcott Commission, described the result in these words:

Instead of permitting the mail cars, whether apartment or full postal cars, to be loaded to their full capacity, the government demands that the cars shall be lightly loaded so that there may be ample space for the sorting and distribution of mail en route. In other words, instead of a freight car, a traveling postoffice.

The average load in an average full-size postoffice car is about 5,000 pounds, and in apartment postoffice cars is about 600 pounds. The average load carried in an ordinary freight car on the Burlington road is over 35,000 pounds. Railroads, as a rule, haul one ton of paying or productive freight for every ton of dead or unproductive load. In the government mail business they carry nineteen tons of dead weight for every ton of paying freight.

In the third place, on practically every railroad mail route where there are heavy weights and a large aggregate payment for carrying the mails, the service is performed in special fast-mail trains, at great and unusual expense.

The heaviest mail route west of Chicago is between that city and Omaha, and since 1884 this service has been performed by the C., B. & Q. Railroad in three special fast-mail trains—two westbound and one eastbound. Two-thirds of all the earnings on this mail route are received from mails carried on these three special fast-mail trains.

In 1900 a witness before the Wolcott Commission, Mr. Dixon H. Kennett, presented the following statement of the actual earnings of these fast-mail trains in comparison with earnings from C., B. & Q. passenger trains between the same points:

The following are the earnings of the fast-mail trains, per train-mile, including the pay for railway postoffice cars:

Train No. 7.....	\$0.82
Train No. 15.....	1.33
Train No. 8.....	0.61

an average for the three trains of 92 cents per train-mile.

The earnings per train-mile, from passengers alone, for the year ending Dec. 31, 1899, of the six through passenger trains, which operate both ways between Chicago and Omaha, are as follows:

Train No. 1.....	\$1.07
Train No. 2.....	1.79
Train No. 3.....	1.37
Train No. 4.....	0.92
Train No. 5.....	1.33
Train No. 6.....	1.03

an average for the six trains, from passengers alone, of \$1.26 per train-mile.

During the fifteen years since then earnings have increased in the aggregate, as shown in the following table of earnings in 1914, from the same trains :

Train No. 7.....	\$1.08
Train No. 15.....	1.94
Train No. 8.....	0.64

an average for the three trains of \$1.22 per train mile.

Train No. 1.....	\$1.97
Train No. 2.....	1.98
Train No. 3.....	2.43
Train No. 4.....	1.25
Train No. 5.....	1.56
Train No. 6.....	2.17

an average for the six trains, from passengers alone, of \$1.89 per train-mile.

These figures show that these fast-mail trains are now earning an average of \$1.22 per train-mile, compared with 92 cents per train-mile in 1900, an increase of 33 per cent, while the passenger earnings average \$1.89 per train-mile, compared with \$1.26 per train-mile in 1900, an increase of 50 per cent, and that passenger trains on the C., B. & Q. Railroad, between the same points, earn one-third more than the government pays for the special fast-mail service.

These special fast-mail trains are, moreover, unusually expensive.

Mr. Frederic A. Delano in 1900 was superintendent of motive power on the Burlington road and was invited before the commission to discuss speed in its relation to expense, as shown from his study of the question, in connection with these fast-mail trains. He estimated that, in view of the extra expense and the high value of the service, the government ought to pay a bonus of \$1 per train-mile in addition to the 92 cents per train-mile that it was then paying.

Mr. Delano named several elements that enter into the increased cost of the fast-mail service as compared with the slower moving passenger trains, among which are the increased fuel consumption of locomotives, owing to increase in train resistance, less economical burning of coal and the less economical use of steam; then there is the higher grade of service required in all departments and the increased cost of failures in operations from hotboxes and increased liability to accidents and the added cost of operating other trains in getting out of the way of these special trains. The average speed of passenger trains is about 30 miles per hour, but these special fast-mail trains run 48 miles per hour. The most important element, in Mr. Delano's judgment, is the increased cost due to delays and detention of other trains, incident to sidetracking in order to clear the tracks for these swift mail trains.

The service on the Burlington, which carries the heavy mails west of Chicago, is similar in character to that performed by the Pennsylvania, New York Central, St. Paul, Santa Fe, Missouri Pacific and other roads. The aggregate compensation to these companies sounds large because of the concentration of weights in order to induce companies to furnish special fast-mail trains. But it is the most economical service which the postoffice receives from anybody and is probably the least remunerative to the railroads of any service they render, owing to the very low rates resulting from the sliding down scale in the law and the extremely light loading possible in postoffice cars, and the unusual expenses of the special mail trains which carry two-thirds of the mails on these heavy routes.

If the question is asked why companies continue to furnish this great service to the government for inadequate compensation, the answer is this: The companies are contending for better compensation and hoping that Congress will grant it. Besides, these trains earn something above the bare cost of running them, and whatever a railroad can save above such cost contributes something toward the payment of taxes, interest and maintenance expenses, which would largely continue if they should refuse to carry the mails.

But is that any reason why the government should not pay a fair compensation for the service?

The government receives from these railroad companies that carry the heavy mails the highest class service performed anywhere in the world. No such mail service is rendered in any other country, and the bulk of the vast income of the postoffice is earned on these heavy mail routes.

A policy which results in either the destruction or serious impairment of this high-grade service will not commend itself to the public.

W. W. BALDWIN,

Vice-President, C., B. & Q. R. R. Co.

Chicago, April 6, 1915.

PARCEL POST AND ITS EFFECT ON RAILWAY REVENUES*

BY V. J. BRADLEY,

GENERAL SUPERVISOR OF MAIL TRAFFIC, PENNSYLVANIA RAILROAD.

A study of the revenues of express companies for the last two years is not without profit, because impressions can be gained as to the drift of events, even though no certain conclusions can be reached. The express revenues of the fiscal year ended June 30, 1913, were affected by only six months' competition with the parcel post, but those of the next year suffered from this cause for a full year. And in five months of this last twelvemonth reduced express rates were in effect.

The gross revenues from operation of all express companies for the fiscal year ended June 30, 1913, as compared with the previous year, were as follows:

	1913	1912	Increase	Per cent.
Mileage	301,064	283,303	17,761	6.27
Revenue	\$168,880,923	\$160,121,932	\$8,758,991	5.47†

This increase of \$8,758,991 was in spite of the competition of the parcel post for the last six months of the year. It might be held that the additional revenue could be credited entirely to the new mileage, which increased in greater percentage than the revenue; but the mileage does not always have a harmonious relation to the revenue.

While there must have been some loss of business because of the parcel post, the amount evidently was not large enough to be positively disclosed in the gross revenues. We may also conclude, at least tentatively, that a large amount of the parcel post traffic from January 1 to June 30, 1913, was new business.

The only statistics yet available for the year ended June 30, 1914, are those of the Adams, the American and the Wells-Fargo companies. These, combined, represent nearly 70 per cent of the revenues, and 65 per cent of the mileage of all of the express companies. For comparison the figures are given since 1912.

*From a paper read before the New York Railroad Club on November 20, 1914.

†The corresponding figures for 1914 were: mileage 305,690, increase 4,069; revenue \$158,891,326, decrease \$9,989,597 or 5.92 per cent.

ADAMS, AMERICAN AND WELLS-FARGO COMPANIES.

Year	Revenue	Increase	Per cent.
1912.....	\$110,372,802	\$10,666,994	10.69
1913.....	117,965,952	7,593,150	6.87
1914.....	110,579,322	dec. 7,386,630	dec. 6.26

If the revenues of these three companies for 1914 had shown the same growth as between 1912 and 1913, they would have been \$125,000,000.

Part of the deficit is due to reduced rates. One prediction was that these would result in a reduction of 22 per cent. As the reduced rates were in effect only five months of the year, this would be equivalent to 9 per cent, or about \$11,000,000, which, subtracted from \$125,000,000, leaves \$114,000,000. Comparing this with the actual earnings of about \$110,000,000, leaves \$4,000,000 to represent the maximum amount that could be due to parcel post competition. Another prediction was that the new rates would reduce revenues 17 per cent. On that basis the loss in 1914 was \$8,750,000, leaving the maximum loss attributable to parcel post competition about \$6,000,000.

[Mr. Bradley quotes the estimates made by the Interstate Commerce Commission in 1909 that the average weight of express packages was 32.80 lb.; that the average revenue per package was 50.49 cents, and the average per pound 1.54 cents; and then, comparing with other estimates concludes that in the year to June 30, 1914, the express companies lost 24,000,000 pieces. He then goes on.]

The active competition of the parcel post is from 1 to 11 lb., and from the first to the third zone. The 4-lb. package would be the typical average, for which the express rate to the third zone would be about 25 cents. The loss to the express companies was seemingly about 5 or 6 per cent in pieces and about 3 or 4 per cent in revenue. If express companies lost \$6,000,000 in revenue, the railroads lost approximately \$3,000,000.

In Great Britain, the parcel post is a distinct class of postal matter and pays the railroad companies 55 per cent of its revenues. In this country, Congress did not establish the parcel post as a class by itself, but merely extended the fourth-class of mail matter from a weight limit of four pounds to a weight limit of 11 lb., and rearranged the rates. This fourth-class in 1912, before the parcel post was established, already embraced about 240,000,000 pieces a year, weighing about 76,000,000 lb., with an average weight per piece of 5 oz., or 3.16 pieces per pound. The revenue from this class was about \$12,500,000.

When statements are made regarding the volume of parcel post business, it is necessary to inquire whether the amount quoted includes or excludes the old fourth-class mail.

The postmaster general predicted at a Congressional Committee hearing December 3, 1913, that during the fiscal year 1914-1915 there would be transported 600,000,000 parcels that would yield a revenue of 10 cents a piece, or a total of \$60,000,000. This estimate undoubtedly included the old, as well as the new, fourth-class matter and might be restated as approximately 300,000,000 parcels.

A representative in Congress, who has made some study of the subject, estimated the bona fide parcels at 150,000,000 in 1913, and 250,000,000 in 1914, thus showing a growth in one year of 66 per cent. If we calculate the weight of these parcels at 4 lb. each, we obtain a total weight in 1913 of 600,000,000 lb., and in 1914 of 1,000,000,000 lb. About 95 per cent of this weight is carried on the railroads. Therefore, we may say that the railroads carried in 1913 about 280,000 tons, and in 1914 about 475,000 tons of additional mail matter for an average distance of about 300 miles. The ton mileage of this mail in 1913 would, therefore, have been about 84,000,000. The Post Office Department reported to Congress as of April, 1913, a ton mileage for all mail of 510,000,000. The addition was, therefore, about 15 per cent in that year and even greater in 1914.

The only action by Congress towards compensation was an allowance of 5 per cent increased pay to the railroads until the mails were weighed in regular course, but this weighing is only made once in four years. The 5 per cent allowance amounted to \$1,687,360, although the additional revenue received by the Post Office Department from the first year's new business was estimated at about \$15,000,000. The railroads in the First Contract Section (the New England states, New York, Pennsylvania, New Jersey, Delaware, Maryland, Virginia and West Virginia) did not receive the 5 per cent allowance, because the mails were weighed on these roads from February to June, 1913, and they were supposed to receive the benefit of some of the increased business. Even if this were true, it cannot be considered an adequate provision for the increase of the following four years, especially as it appears that there is a growth of 66 per cent in the second year.

In conclusion it may be said:

1. That so far as the railroad revenues are reduced at the present time because of the reduction in the revenues of the express companies, this is more due to the new rates prescribed by the Interstate Commerce Commission than to the competition of the parcel post.

2. The parcel post, by the creation of a large amount of new business as well as by taking some business from the express companies, has greatly increased the tonnage of the mail transported without any adequate provision for payment to the railroads. It is of great importance that such remedial action be taken promptly, not only because justice to the railroads requires it, but also that the government may obtain information as to the full cost of performing the parcel post business. The knowledge of the full cost of transporting the parcel post business will save Congress from approving of parcel post rates which would result in a heavy increase in taxation.

WHAT THE GOVERNMENT RAILROAD GETS FOR CARRYING THE MAILS

FROM BULLETIN ISSUED BY THE COMMITTEE ON RAILWAY MAIL PAY
—RALPH PETERS, CHAIRMAN.

The Panama Railroad has only one stockholder—the Government of the United States.

The railroads operating in the United States are owned by hundreds of thousands of citizens, who hold their stocks and bonds.

The Panama Railroad in the last fiscal year received more than \$2.77 for each ton of mail carried one mile. This is shown by figures in its annual report.

The Post Office Department has estimated that the railroads of the United States receive approximately 10 cents for each ton of mail carried a mile.

The rate paid the government-owned Panama Railroad for carrying the mails is therefore about 28 times as great as the average rate paid the privately owned railroads of the United States.

Had the Panama Railroad been paid at the average rate allowed the railroads of the United States, it would have received last year only about \$9,000 for carrying the mails. It actually received \$250,306.

On the other hand, if the railroads of the United States last year had been paid the Panama Railroad rate, their receipts for carrying the mails would have been \$1,557,000,000, or more than five times the total revenues of the Post Office Department. They actually received \$56,000,000, or about one-fifth of the Department's revenues.

The high rate paid the Panama Railroad for carrying the mails is not warranted on the ground that its mail traffic is small and that it is therefore performing a retail service. On the contrary, its mail traffic is large, exceeding 10,400 pounds daily.

The railroads of the United States make no claim to be entitled to the excessive mail rates paid the Panama Railroad. These comparisons are offered merely to show the difference in treatment accorded to a Government-owned and to privately owned transportation systems in this respect.

The railroads owned by citizens, in fact, have not asked Congress to advance their mail pay rates at all. They have merely asked

to be paid for *all* the mail they carry and *all* the special facilities and services they furnish the Post Office Department.

WHAT THE PANAMA RAILROAD CHARGES FOR CARRYING TREASURE

In a previous pamphlet the Committee on Railway Mail Pay told how the Treasury Department obtained the transportation of 200 tons of gold—\$99,000,000 worth—from Philadelphia to New York without cost to the Government for the railroad service required.

The gold was simply declared to be parcel post and was "mailed" as such, thereby compelling the railroad to carry it without additional payment under its four-year mail contract with the Government. Four special cars were used and were hauled into New York by special engines. More than 100 guards were carried the round trip without payment of fare.

The Government-owned Panama Railroad is at times also called upon to transport treasure. Last year it carried \$9,228,660 worth across the Isthmus and charged \$28,129 for the service.

New York is about twice as far from Philadelphia as the city of Panama is from Colon. The value of the treasure shipped from the Philadelphia Mint to the New York Sub-Treasury was more than 10 times the value of what the Panama Railroad carried.

A CONTRAST IN RATES.

Had the Government paid for the Philadelphia-New York gold shipments at a rate relatively as great as the Panama Railroad charges for carrying treasure the payment for the service would have been nearly \$600,000.

Such a charge would have been grossly inordinate by comparison with rates prevailing in the United States. The express charge for shipping \$99,000,000 gold from Philadelphia to New York would have been \$64,350. For this sum the express company would have undertaken to perform all the details of the service. It would have arranged for (and also paid for) the railroad transportation, would have insured the gold and furnished its own guards.

The railroads are not prepared to say whether the express company's charge for such a service—risk and responsibility duly considered—might properly be more or less than the sum named. The

important fact is that this charge represents a rate equal to only a little more than 10 per cent of the Panama Railroad's rate for treasure transportation.

The Government-owned Panama Railroad obtained nearly 6½ cents for each \$1,000 of treasure carried one mile. The express company's charge for carrying gold between Philadelphia and New York would have been about 7-10 of one cent for each \$1,000 transported a mile, and this would have included insurance in transit and fair payment to the railroad.

But, by requiring the railroad to carry the gold as "mail," all cost to the Government, save for guards' wages, was eliminated.

EXPRESS vs. PARCEL POST*

BY C. D. CHURCHILL,

AGENT ADAMS EXPRESS COMPANY.

There has been so much said about the parcel post and about the parcel post taking the place of the express companies that some people are inclined to think that it is really doing that. The parcel post, while there is no doubt that it has come to stay and that it will handle a large amount of traffic, the service, as far as the public is concerned, is inadequate as compared with the express.

The express companies, through their different departments, such as the commission department, the purchasing department and the department for developing markets, have been of great service to the public in building up markets and other services that would probably never have been done by any other service.

With reference to the latter, some of the companies maintain a field force particularly charged with the supervision of shipments of produce or other perishables. These industrial agents are required to keep close watch on the production and distribution of farm and orchard products from their territory; they will assist the producer in finding a market for his goods, or will assist a customer or dealer in finding a producer from who he can purchase. No charge is made for this service, but the express company receives the haul on the traffic and is thereby recompensed indirectly for the service performed. Rocky Ford melons were brought East by an express company as an experiment; the same may be said of the California asparagus. The movement was at first on a small scale, but as soon as the eastern consumers became acquainted with the merits of these, the growers of this species took immediate steps to increase their acreage and the volume of the movement became so great that the railroads established fast freight refrigerated service to take care of the traffic.

These are only two illustrations of many that could be cited where the commission departments of these carriers have started in a small way a movement of traffic that has increased from year to year until it has assumed vast proportions, resulting in increased production on the one hand and a benefit to the consumer on the other.

*Letter to the *Traffic World* Sept. 19, 1914.

In making comparisons, then, between the express and parcel post service and rates, there must be kept in mind the difference in the character of the service given by each carrier.

The express company handles small packages and fragile articles in safety trunks, while such shipments are handled by the post office in sacks.

The express company gives a receipt for each shipment, which enables the shipper to prove that he has actually made shipment, while the post office gives no receipt unless insured.

The express companies assume liability for all loss or damage, while the government insures only against total loss or destruction.

The express company agrees to carry money, valuables and bullion, assuming full risk in transit; the post office does not.

Express companies have facilities for handling personal commissions, such as payment of taxes, collection of notes, purchase of sale goods; the post office does not undertake such commissions.

Express companies make a specialty of transporting perishables and commodities that require refrigeration or icing in transit; the government does not have the facilities to handle such traffic.

Express companies will accept a shipment of any weight, and special rates are made for carload shipments; the government limits the weight of a package and makes a separate charge for each.

Express companies will accept shipments with charges collect from the consignee; the post office requires prepayment of transportation charges.

The parcel post rates are not insured, and to make a fair comparison with express rates it is necessary to add to the scale of parcel post rates the insurance charge, which is 5 cents for a \$25 valuation and 10 cents for a \$50 valuation. When these charges are added, the express rates appear in a more favorable light.

Another drawback to the use of parcel post is the character of the insurance offered by the government; the article must be damaged to such an extent as to make it wholly useless, or it must be lost entirely, in order to obtain redress. The express company under its contract assumes full risk and will pay for any character of damage.

From the foregoing it is evident that the express companies are offering to the shipping public certain facilities that have been largely instrumental in building up the business of this country—facilities that are not only absolutely necessary to certain lines of trade, such as deal in perishables, live animals, or highly valuable merchandise,

but also upon which the merchants have come to rely to such an extent that any curtailment of these facilities would seriously embarrass them.

The flexibility of the express service is much greater than that of any government service.

When it is necessary to establish a new rate, the express companies are in a position to act quickly, whereas it is very difficult to secure the authority for any deviation from rates or rules established by the postal department, and the delay which would necessarily result while such cases are going through the regular channel of the department would greatly inconvenience the merchant, who, in many instances, would be unable to wait until the rate was established.

It is therefore evident that the post office could not under present conditions serve the public on certain classes of traffic as well as it is now being served by the express companies, and that the business needs of the merchants could not be as effectively met by the post office even if the express companies were abolished and the government undertook to do the express business, because of the inflexibility of government regulation, if for no other reason. Those who advocate government ownership of these carriers have apparently failed to acquaint themselves fully with the requirements of the merchants and the details of the express service, with its "personal" attention to the individual rather than the general demands of the shipping public.

C. D. CHURCHILL,

Agent Adams Express Company.

Almena, Kan., September 10, 1914.

LOCAL FREIGHT BY PARCEL POST

FROM THE RAILWAY-AGE GAZETTE

The photograph illustrates in a striking manner the extent to which the railways are being called on to carry local freight on passenger trains under the guise of United States mail. The boxes shown are part of a shipment of 250 cases of condensed milk sent by wholesale grocers of El Paso, Tex., to Mogollon, N. Mex., about 80 miles inland from Silver City. These cases weighed 42 lb. each or a total of 10,500 lb. They were delivered to the Atchison, Topeka & Santa Fe at Deming, N. Mex.

One of the most flagrant abuses of the parcel post in the southwest lies in the shipping of groceries from the larger towns to outlying points. One illustration is shipments of this nature moving over the Santa Fe from Albuquerque to Los Cerrillos, the final destination being Cuba, N. Mex., and other inland points. On April 28 a ton of flour was shipped in 50-lb. sacks; on May 21, half a ton of oats, 50 lb. of potatoes and a box of canned goods were handled; on May 23, 1,100 lb. of flour was taken; on May 27, 1,400 lb. of sugar and potatoes, and on May 30, 2,620 lb. of sacked wheat.



HANDLING 242 BOXES OF CONDENSED MILK BY PARCEL POST

As a further illustration, there was shipped from Deming to Mogollon on March 12, 70 sacks (3,500 lb.) of beans by parcel post, at a postage rate from Deming to destination of \$1.04 per 100 lb. The freight rate for this same business is 30 cents from Deming to Silver City and \$1.25 from Silver City to Mogollon by team, or \$1.55 per 100 lb. through.

The reason for this traffic going by parcel post is evident. The freight rate from Albuquerque to Los Cerrillos is \$1 per 100 lbs. while the parcel post rate is \$1.08 to destination. The star route carrier having the contract for handling the mail to Cuba and two or three other inland towns receives \$2,600 a year. Prior to the establishment of parcel post he made two or three trips a week with a light buggy, but since the parcel post has come into action he is now required to make extra trips with a wagon.

THE PERSONAL INJURY PROBLEM*

BY GEORGE BRADSHAW,

SAFETY ENGINEER OF THE GRAND TRUNK PACIFIC.

We have heard much about the "personal injury problem on railroads." That there is such a problem no one can deny, because last year on the railroads of Canada and the United States, in round numbers 11,500 persons were killed and 205,000 persons were injured. These are numbers of great magnitude, but given in the aggregate, and without analysis, they should be accepted only as proving the existence of such a problem.

It should be borne in mind when considering this problem that authentic reports are made of casualties occurring on railroads while such reports are not made of casualties in other industries. For this reason the injury record on railroads appears worse in comparison than it really is and this fact has brought upon railroad an unjust proportion of public criticism. We have no disposition to conceal our record in the shadow of others; but since things are good or bad only by comparison, it is but just to make this reference to the record of those engaged in other lines of work.

REAL RESPONSIBILITY WITH THE PEOPLE.

Away back of this personal injury problem, and yet directly connected with it, is another problem relating to us as a people. It is one of our characteristics that we do things, and do them quickly and vigorously. We can forgive any mistake, except the mistake of doing nothing. When we really want to do a thing, cost, whether estimated in men, money or materials, has always been a secondary consideration. Our heritage and environment are responsible for this characteristic. Our ancestors, not so many generations ago, left the protection of the old world for the insecurity of the new. They built their huts in the wilderness, subdued the savage, drove out the wild beast, explored, settled, cultivated and developed a virgin continent. They could never have done this on the principle of "Safety First." They were from necessity, and we are from heredity, a militant people struggling with the forces that oppose the realization of an all consuming ambition. And while "Peace hath her victories no less renowned than those of War," she also no less relentlessly demands the price of her victories. We have been paying her price

*Before the Western Canada Railway Club, Winnipeg, Nov. 9, 1914.

in the killed and maimed from our furnaces and factories, our shops and streets, our mines and mills, and as we have become more accustomed to paying the price, so we have been subjected to a greater tendency not to question the necessity of the consideration. In short, we have become two nations of chance takers.

We are injuring and killing an army of people every year in the conduct of our simple personal affairs, running farm, business and other machinery, handling wagons, motor cycles and automobiles. During the past year within a few miles of my home, three persons have been killed while riding motor cycles, two seriously injured in an automobile accident and three injured by other vehicles. The newspapers show that these are common occurrences all over the continent. Yet the very people whose thoughtlessness in their own affairs is causing such wholesale slaughter are the people with whom the railroads must deal. Can we expect that people who fail to use common safety precautions for their own protection when in their homes, places of business and upon the streets and highways will use such precautions when about to cross railroad tracks or when passengers on trains?

In their efforts to promote safety on railroads, legislators and other public representatives have failed to give proper consideration to this element of public responsibility. We have been proceeding upon the theory that compliance by railroads with public regulations, if made sufficiently numerous and comprehensive, would insure safety to people who have not themselves learned to conduct their own affairs according to safe standards. The Safety Movement has no fault to find with reasonable public regulations, but it does contend that the solution of this problem depends quite as much upon bringing the people to a full appreciation of their personal responsibility.

TRESPASSERS.

The necessity for educating public sentiment is shown in the number of trespassers killed on railroads. More than 50 per cent of the entire number of persons killed on railroads in the two countries are trespassers. Sixteen people are killed in this way for every day in the year. This is simply wholesale slaughter and slaughter, too, from a risk which it is unnecessary to incur. While there are laws in Canada and some of the states prohibiting trespassing on railroads, no one pays any attention to them. There seems to be an impression abroad that hoboos and tramps constitute the trespassers killed on railroads; but the truth is that perhaps

80 per cent of such persons are useful citizens with fixed homes, laboring men walking along tracks or riding cars to and from their work, business men and, in fact, the public generally using railroad tracks as a convenient pathway, persons picking up coal in yards and children "flipping" cars. In other words, the railroad trespasser is the average citizen. The real sufferers are the dependent families of the victims; but the public also suffers, first, in being deprived of the services of those killed and maimed and, secondly, in the increased burden of caring for those who are thereby made destitute and helpless.

The railroads are powerless to control this situation. It will continue till public sentiment puts a stop to it. Some of the roads, among which the Grand Trunk and the Grand Trunk Pacific are prominent, are endeavoring to educate the public to observe safe standards of conduct when about railroads and to discontinue the practice of trespassing. With this purpose in view they have safety precautions printed in their public time-tables and posted in stations and other public places, occasionally articles in the press, and often hold safety meetings to which the public is invited. We are now arranging to start a campaign of safety in the schools by giving to every boy and girl one of the "Safety Buttons" you see on exhibit at this meeting and by having their attention called to the great danger of walking on railroad tracks and playing on or about cars.

It is gratifying to note that since the railroads started their vigorous campaign for greater safety, commercial industries, public service corporations and cities and towns from one end of the country to the other have fallen into line with the result that more is today being said and written—and *done*—for the prevention of injuries than ever before. But we have really only begun. What is needed both in Canada and the United States—for conditions are identical in the two countries—is a department of government, or perhaps a bureau in some existing department, for the purpose of interesting and educating the public in matters pertaining to safety, not by issuing volumes of statistics and long technical reports; but by systematic instruction in schools, readable topics in the public press, notices posted along highways, moving pictures and lectures.

PASSENGERS.

Let us now consider this problem in its relation to passengers. The one purpose of railroads is to transport persons and property, and their first duty is to conduct such transportation with the highest

reasonable degree of safety to their patrons. So far as the safety of passengers is concerned there is really no problem, except, as already indicated, the problem of educating people to a better observance of safe conduct in their own actions over which the roads have no control. The record shows that there has never been a mechanical device of determined merit invented nor a method of operation of known effectiveness proposed that would reasonably insure greater safety to the traveling public than the leading railroads of our countries have not adopted as promptly as consistent with a thorough determination of merit and that the other roads—the smaller and weaker ones—have not adopted as fast as their ability permitted them to do so. Until recently we heard a great deal about automatic train stops. We don't hear so much now, because the American Railway Association, after a careful consideration of the subject, expressed an opinion as to what such a device should and should not do under various conditions in order to be reliable and effective; and one railway system offered a reward of \$10,000 (which has not yet been won) to the person who would construct an automatic train stop to meet certain specified and necessary tests. One leading road has already installed the wireless telephone on its trains. If it proves serviceable, other roads will soon follow the example and in a reasonable time such device will be a regular part of the equipment of every road that can afford it. Four years ago the Safety Movement was developed and having proved effective, it has now been introduced on more than half the mileage of the two countries. And with only a very small percentage of exceptions, these devices and methods have been introduced voluntarily and not as a result of compulsory legislation.

SAFETY OF RAILROAD TRAVEL.

As a consequence of this record, travel on railroad trains has become not only safe, but safe to a most remarkable degree. Mark Twain once said that it is safer to travel than to stay at home because so many more people die in their own beds than on trains. And it is literally true that "it is safer to travel than to stay at home." Insurance companies prove this to be so, because one can secure for the same premium double the amount of indemnity against death from train accident as from accident in an ordinary occupation or from accident even in one's own home.

I am not seeking to justify preventable wrecks which we all know do occur now and then and I have something to say about that

particular phase of the subject later. But let those who may be inclined to pass harsh judgment upon railroads for these unfortunate occurrences first consider upon what a multitude of elements, conditions and combinations the safety of every train depends. First, there is the human element. A hundred, perhaps a thousand, men with individual duties requiring performance in a particular manner, at a particular time and place, separated by miles, yet all working together. It's so easy to make a mistake, even when one is trying to do his best—to misunderstand, to forget, to neglect some little detail, to use poor judgment—and yet a single error on the part of one man—just one in a hundred, or one in a thousand—may result in a train accident. Now, multiply your own personal liability to error by that of 100 or 1000 and that by 60 by 24 and by 365. Then, there is the physical element. Ties, rails, bridges, embankments, grades and curves. Millions of bolts, bars, beams and braces, links, levers, staples and spikes, a flaw in even one of which may possibly cause a wreck. And yet in spite of all these circumstances, last year 299 companies operating approximately 121,000 miles of road, carried in round numbers 410,000,000 people—more than four times the combined population of the two countries—without killing a single one in a train accident. *

EMPLOYEES.

Coming now to employees. Of the 205,000 persons injured on the roads of the two countries last year, 174,000, or 85 per cent, were employees. This is within a few points of the ratio from year to year. It is evident, therefore, that here is the real personal injury problem with the solution of which the Safety Movement on railroads is chiefly concerned.

An exhaustive analysis of thousands of cases of injury occurring from year to year over an extensive mileage, under all possible conditions and to all classes of employees has shown, first, that from 60 to 70 per cent of such cases are preventable and, secondly, that of those which are preventable, 80 per cent of them are due, not to improper or inadequate physical conditions or appliances, but to the employee's lack of knowledge of safe methods or to his indifference to the use of such methods. This may not be pleasing information to employees, but it is absolutely true. They are by no means chargeable with entire responsibility for its being true. Men are no better than they are educated and trained to be.

*Railway Statistics of the United States, 1913, p. 104.

We have been taking it for granted that employes should as a matter of course know the safe and unsafe ways of doing their work. We have assumed that they know it to be dangerous to go between moving cars, to kick a drawbar to make coupling, to stand between apron of coal chute and cab when taking coal, to strike tempered steel with a metal object, to use "mushroomed" chisel or hammer, to throw boards about with points of nails projecting upward, to leave a baggage truck at edge of station platform, to use a track jack between the rails of main track and scores of other apparently simple things. Not only have we assumed that employes know the safe and the unsafe methods in performing their routine work, but we have also assumed that, without any special instruction on this subject, they would of their own accord take the safe course. The best proof that these assumptions are not well founded is the fact that employes are continually getting injured and killed doing things in an unsafe manner which they could just as well do in a safe manner. An engineer had some fingers blown off while screwing down the cap of grease cup on side rod due to explosion of fusee powder which he had put in to cool the cup. A storehouse employe used a lighted torch to locate a leak in a gasoline tank. He located the leak all right, but there was afterwards difficulty in locating the employe. A trackman, finding a torpedo, held it on the rail and struck it with his pick to find out what it would do—and he found out. Only a few days ago a sectionman—an English-speaking person considerably above the average in intelligence—was burned to death in attempting to start a fire with kerosene. While, of course, these examples are somewhat out of the ordinary, cases of a more routine and less impressive nature, yet due to the one cause of ignorance of safe methods, are occurring by the hundreds every day.

EDUCATING EMPLOYES.

It is believed that there is but one way to prevent injuries from this source and that is to educate employes in the safe methods of doing their work. This is one of the purposes of the Safety Movement and I will now ask your attention to a short illustrated talk on "Safe and Unsafe Methods for Railroadmen" which will give you an idea of how we are going about this matter.

(This part of the address was followed by a series of fifty stereopticon views showing unsafe and safe practices and conditions with explanation and comment.)

THE PHYSICAL VS. THE HUMAN MATERIAL.

The most important and the least considered factor in railroad operation is the human element. This element is responsible for four times the number of preventable injuries and deaths and four times the amount of avoidable damage to property as all other elements combined. Yet it receives not one-fourth nor one-fifth nor even one-tenth of the attention given to other elements. We spend immense sums in selecting, grading and testing materials and when we have built the best track and turned out the best engines and cars that money can produce, we depend, in selecting the men who are to operate this perfect equipment, upon the broad experience, the ripened judgment and the profound knowledge of a clerk in the superintendent's or trainmaster's office who, with the exception of the doctor making the physical examination, is often the only person connected with the road having anything to do with the applicant till he has been set to work. It's all right and proper to educate employes in the safe methods of doing their work, in the manner which I have indicated, but we have not yet gone at this proposition in the most logical and effective way. What we should do is to use more care in selecting the employes to be trained. There is no industry which is in a better position to demand and secure a high type of employe than the railroads, because, in the first place, there is a certain fascination about railroad work which appeals to young men and because the pay, especially in train service, is exceptionally good and the prospects for promotion are encouraging. Yet most railroads fail to avail themselves of these favorable opportunities. We often hear it said when business is particularly heavy that we "have to take anything we can get." That's true under present methods of employment, but the railroads are entirely responsible for its being true. The cleanest and most capable young man in the country may apply for a job braking or firing, and if we don't happen to need him at the time, he gets little consideration, often only scant courtesy. He goes somewhere else and gets employment and then when business picks up and we have to have men, we have no waiting list—we don't even bother to take the name and address of such men—and that's the time we "have to take anything we can get."

While the great body of railroad employes will compare favorably with other classes of men, yet it is true that we have in our ranks too many who belong to the "anything we can get" class. To

expect the Safety Movement to make safe men out of some of the human material engaged under our present methods of employment is about as reasonable as it would be to buy rotten ties and expect to make them serviceable by some kind of treating process.

I believe we should insist upon an educational qualification, at least equal to that of the eighth grade, for all employes entering train, yard, station or telegraph service. When an applicant has satisfied the educational and physical requirements, he should be subjected to a most rigid character investigation by some officer assigned particularly to this work to whom all applications, in these branches of the service, should be referred and who would be able to keep a list of eligible men to be drawn upon as needed.

The great importance of the selection and training of men is indicated by the report of the Interstate Commerce Commission for the year ending June 30th, 1913, in which it is said:

"The Commission again is compelled to note the exceedingly large proportion of train accidents due to dereliction of duty on the part of employes. Fifty-six of the accidents investigated, during the year, or nearly 74 per cent of the whole number, were directly caused by mistakes of employes. These mistakes were of the same nature as those noted by the Commission in its last annual report, namely disregard of fixed signals; improper flagging; failure to obey train orders; occupying main track on time of superior train; giving lap order or using wrong form of order; excessive speed; failure to identify train that was met; leaving switch open in face of approaching train."

We have heard and talked so much about safety devices that we have largely overlooked the human device. We string our tracks with automatic signals which can't give an unsafe indication once in ten thousand times. Yet, let an engineer, through inattention, run one of these signals and cause a serious train accident and the newspapers, politicians and the public begin to clamor for more safety devices. They want flash lights in the cab, audible signals added to the visible and automatic train stops. As has been said, there would be just as much sense in equipping automobiles with fenders to prevent reckless drivers from striking people.

IS MORE OFFICIAL SUPERVISION NECESSARY?

The Interstate Commerce Commission contends that there is need for more official supervision directed specifically to matters of safety. Perhaps there is some foundation for this position as conditions now exist. But the ultimate solution of the problem

depends not upon more official supervision, but upon more careful selection and more thorough training of employes, together with a more rational and certain method of administering discipline whereby those who wilfully violate safety rules and instructions will be removed—and kept removed—from the service before, instead of after, they have injured or killed somebody.

It should not be supposed from what has been said that the Safety Movement is simply a "please be good" campaign to be conducted by distributing literature and delivering lectures. If it went no further than that, not a great deal of good would be done. The brass band, speech making, notice writing, sign painting, button wearing propaganda, with nothing to go with it and back it up, is like the turkey gobbler—"hell on dress parade, but not worth a damn in a fight."

There should be on every road of considerable consequence a competent man in charge of safety matters to which he should give his entire time and attention and be responsible solely to the chief operating officer. Here is where some roads have made a mistake. They have started this work with a whoop and a hurrah and then turned it loose to shift for itself or tacked it to some existing department to be conducted as a side issue. You can't get results that way; and unless a road is going to start this work right and push it vigorously, there is little to be gained in starting it at all.

The safety engineer should be a man whose knowledge of railroad affairs is such as to make his advice valuable to the heads of departments in matters relating to safety. He should understand the history, reason and proper application of all standard rules, especially those pertaining to train orders and the movement of trains. He should be thoroughly familiar with the application of standard rules and of safety regulations and devices in general on the leading roads. At frequent intervals, he should make inspection of shops, roundhouses, yards and terminals and occasionally an inspection of the entire line. He should merit the confidence of employes and spend much time discussing matters of safety with them and instructing them in the safe methods of doing their work. He should be able to detect unsafe methods and conditions and be prepared to show how they can be made safer without unnecessary interference with operation.

Perhaps it may be said that the officers in immediate charge should note and correct unsafe practices and conditions. They do make correction to a considerable extent; but they can't carry this

work far enough. Their best thought and energy are given to volume of output for the simple reason that there is where the strongest pressure is brought to bear upon them. As a general rule they do the best they can under the circumstances; but this is the day of the specialist and the safety engineer is a specialist.

Let me now refer to an objection sometimes urged against the advisability of creating a separate branch of the service in the interest of safety, namely, that it interferes with departmental organization. The best answer to this objection is that it does not interfere. Let those who claim that it does, investigate the working of the plan on the leading systems of our two countries. Broad gauge railroad men—and most of them belong to that class—work on the principle that the interests of the road and not those of their departments are of paramount importance. They understand that an impartial and competent person looking at matters from an independent point of view may see many things which would escape their attention. Men of this caliber welcome the assistance of the safety engineer because they know that before he can possibly make a favorable record for himself, he must first help them to make a favorable record.

RESULTS OF THE SAFETY MOVEMENT

The Movement has been in effect on the Grand Trunk Railway for about fourteen months. Comparing months since the work was started with corresponding months before (the volume of traffic being about the same in each case) shows a decrease of 11.5 per cent in the number of employes injured and a decrease of 50 per cent in the number killed. There has also been a most noticeable decrease in the number of injuries sustained by patrons and travelers on highways.

The indirect results attributable to safety work have also been most gratifying. For example, the Superintendent of one of the large terminals advises that since the work was started there has been a decrease of about 50 per cent in the damage to equipment from rough handling. In the terminals referred to, during last January and February, 46,000 cars were handled without one dollar's damage to even a drawbar.

The following statements show results of the Safety Movement on some of the important lines.

CHICAGO & NORTH-WESTERN.

During the four years ending June 30, 1914, compared with the four years on same basis ending June 30, 1910, there was a decrease of 32 per cent in employes killed and a decrease of 26.5 per cent in employes injured; a decrease of 21.8 per cent in passengers injured; a decrease of 18.7 per cent in outsiders killed and a decrease of 6.6 per cent in outsiders injured.

NORTHERN PACIFIC RAILWAY.

A decrease of 73 per cent in the number of employes killed and a decrease of 17 per cent in the number of employes injured.

During the year ending June 30, 1914, as compared with the previous fiscal year, there was a net saving in expenditure on account of personal injuries of \$40,916.17.

DELAWARE, LACKAWANNA & WESTERN.

Employes Injured First Six Months of—

1911.....	137
1912.....	121
1913.....	109
1914.....	99

Employes Killed First Six Months of—

1911.....	34
1912.....	21
1913.....	19
1914.....	7

CANADIAN GOVERNMENT RAILWAYS.

A decrease of 22 per cent in the number of employes injured and a decrease of 60 per cent in the number of employes killed.

ST. LOUIS & SAN FRANCISCO.

During the three years immediately following the introduction of the Safety Movement, as compared with the three years immediately before it was introduced, there has been a reduction in casualties to all classes of persons of 23 per cent.

Examples of this kind could be greatly extended. The Safety Movement is no longer an experiment and asks now to be judged, not by promises, but by results.

SAFETY AND SHORT TRAINS*

BY MARCUS A. DOW,

GENERAL SAFETY AGENT NEW YORK CENTRAL LINES.

This bill to limit the length of trains to a maximum of fifty cars per train has been presented and its passage urged as a measure of safety, it being the contention of the gentlemen favoring the measure that shortening the length of trains will lessen the chances of accident and reduce the number of injuries occurring on railroads incident to their operation. To persons unfamiliar with the details of personal injury work and the prevention of accidents as undertaken by the railroads of today, this argument may appear reasonable but before accepting it as a conclusion it is essential to consider a number of important facts. First of all, I wish to be understood as in favor of any sincere attempt to prevent accidents but as opposed to any movement fostered under a mask of safety for some ulterior purpose which is only to belittle and weaken the real safety movement and destroy the spirit it is intended to promote.

At the outset, the fact must be admitted, even by those the least informed, that safety in reality rests not upon whether there are a few cars more or less in a given train but upon the way in which that train and others on the same road are handled and operated. There is not now, nor has there ever been, a well-fortified argument for nor a sincere demand to shorten the length of trains to increase safety. The Interstate Commerce Commission in all of its exhaustive studies and reports has never pointed out a single case where the number of cars in a train, nor the number of men on a train, nor the number of engines hauling a train were factors contributing to or causing an accident.

If the proposition is fairly considered, it will appear reasonably certain that the passage of the so-called "Short-train" bill will increase rather than decrease the risk of injury.

For instance, we will suppose that on a piece of single track a hundred miles in length there are two trains of more than fifty cars starting from opposite ends of the road and traveling toward each other. There are just two trains to meet and pass each other;

*Substance of an argument made against the "Short-Train" bill by Mr. Dow before the Public Utilities Committee of the House of Representatives at Springfield, Illinois, May 6, 1915.

two trains for the despatcher to handle and two train crews that must be on the lookout, one for the other. But limit these trains to fifty cars and what happens? The two trains are split into sections and, instead of but two trains to consider, arrange meeting points and be on the lookout for, there are now four trains, with manifestly double the risk of accident. In other words, the density of traffic as measured by the number of trains will increase with the shortening of the train, resulting in a greater chance of confusion and increasing the opportunity for error. This feature, of course, becomes more important on roads where the traffic is heavy and density of traffic is already a problem requiring the most skillful attention of expert operating men. Some roads handle a greater density of traffic than others because they have more trackage, more engines and better facilities for so doing and they have increased these facilities year by year as the growth of business demanded. To suddenly require all roads, however, to multiply the number of trains they must handle without a corresponding increase in trackage and other facilities would necessarily result in confusion, increased hazard and excessive delay.

Much stress has been laid by the supporters of this bill upon the great sacrifice of life and limb on the railroads of this country. Admitting freely that there are many persons injured on our railroads and that a large proportion of the accidents resulting in injury can and should be avoided, I wish to point out how these accidents can be prevented and what steps are being taken to prevent them. For years there has been a nation-wide agitation in behalf of greater safeguards for employes of railroads, other industries and the general public. In every state there has been a veritable epidemic of legislation with a view of protecting the working man from possible injury. Safety devices of every description have been installed, rules formulated, regulations adopted and mechanical safeguards invented and applied until it would seem that accidents never could happen. But, the disquieting feature of the situation has been that up to a year ago, in spite of these extraordinary precautions taken to insure immunity from harm, accidents resulting in injuries increased steadily and the very laws that were made to lessen accidents actually seemed to foster them. It remained for the officials of the railroads and other great industries to discover where the real trouble lay. The conclusion was reached that, with all the laws which might be passed and safety devices which might be installed, there would be

no successful reduction in accidents until there had been enlisted the co-operation of those persons in whose interest such precautions were being taken. In other words, it was found that the human element was knocking all the carefully laid plans of well meaning legislators into a cocked hat and, with this fact in mind, there has been launched within the past few years what has universally been called a "Safety-First" movement. Practically every railroad in the United States is now vigorously conducting such a movement, regardless of the expense incurred thereby. The method pursued on the New York Central Lines was not unlike that of the majority of other roads. The first step taken was to determine the great underlying cause of accidents and then apply the remedy. It was found that most of the accidents were chargeable to the human element. In fact the records indicated that only 9.65 per cent of all injury cases were due to defective equipment, conditions, tools or appliances, the balance being due to fault of injured man or another employe or else unavoidable.

Statistics of accidents on other railroads throughout the country show practically the same proportion of their injury cases due to human thoughtlessness or carelessness. The report of the Interstate Commerce Commission for the fiscal year 1914 divides all death and injury cases to railroad employes in accidents connected with train operation under the following general causes:

Train accidents (collisions, derailments, etc.)	10%
Coupling or uncoupling cars	5%
While doing other work about trains (not in shops or engine houses) or while attending switches	44%
Coming in contact with overhead bridges, etc., while riding on cars	3%
Falling from cars or engines	12%
Getting on or off cars or engines	16%
Other accidents around trains	4%
Being struck or run over by engines or cars at stations or yards	4%
Being struck or run over by engines or cars at other places	2%
	<hr/> 100%

Thus, it is plainly seen that 90 per cent of such accidents to railroad employes are those that may be prevented by the exercise of greater care on the part of the individual rather than by such

legislation as is proposed. It is shown that only 10 per cent were in collisions or derailments, which are, obviously, the only kinds of accidents this law is intended to prevent. In other words, without analyzing the small percentage of injuries due to train accidents to determine the causes of such accidents, the fact is clearly apparent that the big majority of accidents on railroads cannot be prevented by the making of laws and that the only preventative is well-organized safety work conducted mainly along educational lines.

That the railroads entered into this safety work in good faith and desired to co-operate with the employes in the prevention of accidents to the fullest extent possible is demonstrated in the safety committee organizations authorized and fostered by railroad officials. On the New York Central Lines there are 60 of these Division and Shop Safety Committees with an aggregate of approximately 1,200 members and, as on other roads, these committee members consist, for the most part, of employes rather than officers.

These safety committees have been encouraged to freely report and discuss conditions and practices which, in their opinion, ought to be improved to increase the safety of the employes and the public. Since our committees were organized a total of 19,633 items have been reported by members with recommendations for correction in the interest of greater safety and the records show that to date 17,507 or 89 per cent of these items have been corrected. Among all of the items brought up by these employe committees, however, there has never been a single reference to decreasing the length of trains or limiting the number of cars in trains or of increasing the number of men in a train crew, nor has there ever been a recommendation made by any of these committees that such a step be taken in the interest of greater safety.

A canvass of the roads entering the state of Illinois reveals the fact that these roads alone are spending approximately \$200,000 a year in the maintenance of safety organizations. This expense includes only the cost of committee meetings, salaries of safety agents and inspectors, printing and other incidental expenses and does not include the money expended in correcting conditions upon recommendations of the safety committees which latter expense amounts to many hundreds of thousands of dollars annually. As an illustration, the New York Central Lines spent over \$5,000 in the past three years purchasing safety goggles to protect its shopmen from eye injury while engaged in chipping and grinding work. This is

one of the smaller items. Larger ones have included building overhead bridges, fences, walkways, installing improved lighting systems, guarding machinery and changing standards of appliances.

Besides the safety committee organizations, efforts to co-operate with the employes in accident prevention have extended in many ways. Safety Bureaus have been organized on some of the roads with a corps of employes who devote their entire time to a study of the accident prevention problem and in the education of the employes to teach them to avoid unsafe practices. At frequent intervals in railroad terminals large safety rallies are held in theatres or halls where the railroad employes and their families are gathered together for mutual discussion. Here lectures are given and stereopticon views shown depicting unsafe and safer methods of performing railroad work. Inspection trips in special trains are made over the roads by the division committees to encourage the employes who make these trips to be alert for unsafe conditions that may arise. Books, pamphlets and circulars containing warnings against unsafe practices are distributed frequently to employes. The New York Central has equipped a safety exhibit car which contains models showing proper method of safeguarding dangerous machinery and of correcting improper conditions and photographs showing safe methods of performing railroad work. This car, accompanied by expert instructors, is taken over the system and daily instruction to employes on safety matters given therein. This road also produced a moving-picture drama, which depicts in a vivid and forceful manner, through a visualized human interest story, many of the practices of railroad men which cause injuries and the unhappy consequences thereof. This picture is shown in a special car fitted out for that purpose and every employe is required to spend, on the company's time, the half hour or more necessary to witness this film. Other railroads have purchased and are using copies of the film.

The success of such accident prevention work depends almost wholly upon the co-operation of the employes. Railroad officials cannot observe the actions of all employes, nor any considerable part of them, at all times and it is therefore important that the employes themselves become imbued with the safety spirit, a spirit that will not only make them careful in their own actions but will cause them to caution their fellow-employes against unsafe practices when such practices are observed. That is the kind of co-

operation which is necessary to make safety work a success and prevent accidents. The mere slogan "safety first" counts for nothing if the employes do not grasp its full meaning and live up to the spirit of it. If they believe in safety and believe it is a good thing to stop having accidents, then they must rally to the support of that principle by each and every man doing his share of co-operative and willing work to eliminate the real cause of accidents—the indulgence in careless practices. The passage of a train limit or full crew law will not prevent injury to an employe who carelessly goes in between moving cars to adjust a coupling device without taking the time to first stop the cars and who stumbles and falls under the wheels while in that perilous position. It is because the accident records conclusively show that the majority of injuries are caused by just such acts of carelessness as this that the railroads have launched their safety campaigns. The "safety first" movement of the railroads is not a joke, as one of the supporters of this bill has termed it. It is a serious, earnest and practical attempt to prevent accidents by the most effective means and it needs only the co-operation of the men in whose interest the effort is being made to make it successful.

I desire to call attention to some of the advertising matter that has been sent out by supporters of this "Short-train" bill and to some things contained therein which are intended to mislead those unfamiliar with all of the facts. A postal card sent broadcast decries the fact that 594,359 people were killed and injured on the railroads of this country in the three years from June 30, 1911 to June 30, 1914 and particular stress is placed on the fact that 31,851 of these injuries resulted fatally. The fact that 16,463 of these persons killed, or more than 51 per cent, were trespassers who voluntarily and needlessly risked their lives by going upon the railroad tracks is intentionally suppressed. Nor is any explanation made that 12 per cent of the killed were travelers on the highway and that only 30 per cent of the killed were railroad employes while only 3 per cent of the killed were passengers. Supporters of the bill point accusingly to the fact that in three years there were 594,359 persons killed and injured on railroads in the country, leading you to believe that railroad work is the most hazardous of all occupations and that a railroad is a veritable industrial slaughter house, whereas, in truth, railroad casualties form only a small part of the total industrial accidents annually. Conservative statistics of large insurance and

casualty companies indicate that from thirty to forty thousand persons in industrial occupations are killed and more than two million injured every year. These figures do not include other than industrial accidents, such as those occurring in the city streets, etc. The coroner's record for New York City indicates that during the year 1913 a total of 5,750 persons met violent death in the Borough of Manhattan alone, of which 402 were in street accident, 867 were due to falling out of windows, down stairways, off of scaffolds, etc. and 215 were due to accidental drowning. This, remember, is the record for only one city in the Union.

The average American will be astounded to learn of the large number of persons killed and injured in accidents in connection with agricultural work which is presumed by many to be a comparatively non-hazardous occupation. It is regrettable that there is no authoritative record of such accidents in this country but the records of the German Empire for the year 1908 indicate that 32.5 per cent of all permanent total disabilities resulting from industrial accidents in that country were in agricultural employments and 45 per cent of the permanent partial and 45 per cent of the temporary disability cases were chargeable to the same industry.

A further interesting comparison, as to the hazard in railroad work compared with other industries, is found in a statement published by the Prudential Insurance Company of America of the number of male persons killed per 1,000 employed, as follows:

	Persons killed per 1,000 employed
Metal mining.....	4.20
Coal mining.....	3.50
Fisheries	3.00
Navigation	3.00
Railroad employes.....	2.40

It will thus be seen that in reality there is less hazard connected with employment on a railroad than in four other important industries in the country.

It is only fair that we measure accurately just what degree of safety there exists on our railroads today in view of the intent of supporters of this bill to class them as alarmingly unsafe and in need of greater regulation. Interstate Commerce figures indicate that, during the year ended June 30, 1913, on all the railroads of the country, there were 181 passengers killed in train accidents while during that period there were 1,018,283,000 passengers carried.

Therefore, there was one passenger killed in a train accident for every 5,625,873 carried, regardless of the distance they were carried. One of the gentlemen arguing in favor of this bill said he wanted to feel as safe while riding on a railroad passenger train as he would be on the city streets at home. Now, in the city of Chicago alone during 1913 there were 372 persons killed in the city streets by being struck or run over by some moving street vehicle. Chicago has a population of approximately 2,500,000. Therefore, as against 372 inhabitants of Chicago killed in her streets by moving vehicles and hundreds more of her citizens killed in various other ways in a single year, the railroads of the country transported more than twice as many passengers as Chicago has inhabitants before one was killed in a train accident. In cities of New York and Chicago during 1913 there were 774 persons killed in the city streets by being struck or run over by some moving street vehicle, and during the year ended June 30, 1914, there were only 85 passengers killed in train accidents on all the railroads of the country, so that in those two cities alone there were nine times as many persons killed by vehicles in the streets as there were passengers killed in train accidents in the entire country.

The proponents of this bill have insistently intimated that the railroads, almost without exception, have accidents every year resulting in fatal injuries to passengers, the statement having been made that it is questionable if any railroad except the New York Central went through last year without killing a passenger. This high compliment would be gladly accepted by the officials of the New York Central were the statement a truthful one as far as the other roads are concerned but, like other statements which have been made, it was made without investigation. The real truth of the matter is, that, while the New York Central Railroad did not kill a passenger in a train accident last year and, on its Lines East of Buffalo, has not killed a passenger in over four years, during which time it has carried in that territory passengers equal in number to more than twice the entire population of the United States, yet there are many other roads with enviable records of a similar character. In fact, during the fiscal year 1913, there were, in the United States, steam railroads of 299 operating companies, with a mileage of 120,901 miles, which is practically one-half the entire railroad mileage of the United States and which, if stretched out into one long railroad, would form a steel girdle extending five

times around the globe, on which there was not a passenger killed in a train accident, although there were more than four hundred million passengers carried by these roads, a number equal to four times the country's population.

So much for the safety of passengers as it exists on railroads today. Now let us see what degree of safety there is for the employe as far as train accidents are concerned. Interstate Commerce figures also indicate that in the year ended June 30, 1913 there were 557 employes killed in train accidents. During that same period the railroads transported 300,558,334,000 tons of freight one mile with an average of 14.31 tons of freight per car, or 21,003,377,638 loaded cars one mile, so that one employe was killed in a train accident for every 37,708,039 loaded cars moved one mile. And what does this indicate? Simply this, that for every hundred loaded cars operated a distance of 377,080 miles one employe was killed. And this, mind you, does not take into consideration the vast number of empty cars handled at the same time. In other words, one railroad employe was killed in a train accident for each hundred loaded cars transported a distance equal to 15 times around the world, or as far as from the earth to the moon and half way back.

The record for 1914 is even better, as on the same basis of computation only one employe was killed in a train accident for every hundred loaded cars transported seventeen and a half times around the world. Therefore, let us not give way to hysterical reasoning or be misled by unanalyzed figures which tend to place railroads in an unfavorable and unpleasing light as to their accident records.

Another fact, in connection with these figures, indicating 594,359 persons injured and killed on the railroads in three years which must not be overlooked is that the majority of these injuries were of a more or less trivial character. We know that a little over 31,000 of the cases resulted fatally, of which 51 per cent were trespassers. Of the injuries every case is included where the employe lost more than three days from work, and injuries were reported as such which often consisted of only a bruise or scratch of the hand or some other minor injury. An examination of the New York Central record of injuries for a year indicates that only one out of every 227 employes injured was permanently disabled. During the seven months from July 1, 1914 to January 31, 1915, 130,000 reports of injuries to employes were made to the New York State Workmen's Com-

pensation Commission. It is a significant fact that but something over 22,000 of these employes lost in excess of 14 days time as a result of injury.

Other interesting and enlightening facts may be gleaned from a further analysis of the Interstate Commerce Commission figures. For instance, as already stated, the Commission's records indicate that but 10 per cent of all employe injury cases are due to collisions and derailments. Even the majority of these can be prevented only by greater care on the part of human beings involved in the accidents. The Interstate Commerce Commission employs expert investigators who make investigations into the causes of wrecks on railroads throughout the country. These investigations are exhaustive and often weeks and even months are consumed enquiring into every detail of a single train accident. During the 12 years 1902-1913 the Commission investigated through its own agents 1,570 train accidents, of which only 218 or 14 per cent were caused by defective track, equipment or appliances and 15 per cent were due to bad weather, outside agencies, unknown causes or unavoidable, while 1,120 or 71 per cent of the train accidents investigated by the commission in the 12 years were found to have been due to the fault of a member of the train crew, a despatcher, operator or some other employe. The human element! It can never be effaced by all the safety appliances that can ever be invented and applied, nor by all the laws and regulations that can ever be passed and enforced. The one great, powerful factor which will curtail and reduce and which is already curtailing and reducing injuries and deaths to railroad and other industrial employes is co-operation between employers and employes to increase the carefulness of the employes, train them to think and to avoid taking chances. It is this spirit of co-operation that the railroads are spending time, money and effort to develop and foster. It is this spirit of co-operation that will prevent more accidents than all the laws that were ever passed or ever will be passed intended to regulate the safety of modern transportation.

That the railroads stand firmly upon the principle of safety as the first consideration is manifest in every phase of railroad development. Improvements are made in construction, equipment and the efficiency of their personnel on the basis of safety before cost. Safety in railroading is as necessary to successful operation as is the roadbed itself—it is the doctrine upon which all the rules of

operation and maintenance are founded—it is the creed upon which every railroad official builds his hope of successful advancement, for without safety to a reasonable degree a railroad could not exist and do business. This is an age of competition and it is worthy of note that prominent among other things the railroads of today vie with each other to attain the best and most favorable record in accident prevention. In view of all this, is it not reasonable to conclude that, if it were necessary to limit the number of cars in a train to insure their safe transportation over the road, the roads themselves would, for their own protection and to save their own property, adopt such regulation without legislative mandate? But there is not only no proof that the shortening of trains to 50 cars or less will lessen the number of accidents but there is conclusive evidence that increasing the cars in a train does not increase accidents. On the New York Central Railroad the average number of cars per train increased 9 per cent in 1914 over 1913 notwithstanding which fact there was a decrease in every class of accident. There was a decrease of 73 per cent in road trainmen killed in through service and 39 per cent injured; of road trainmen in yards a decrease of 33 per cent killed and 42 per cent injured; of yard trainmen a decrease of 19 per cent killed and 39 per cent injured. While a part of this decrease was brought about by safety educational work, it is partly attributable to the fact that with an increase in the average number of cars per train there was a decrease of 18 per cent in the number of trains run.

The following statement of death and injury cases in train accidents on all the railroads is taken from the Interstate Commerce Commission's records for the fiscal years 1913-1914:

	1913	1914	Decrease
Passengers killed	181	85	53%
Passengers injured	8,662	7,001	19%
Employes killed	557	452	19%
Employes injured	6,905	4,823	30%

Here is further substantial proof that long trains do not increase hazard but rather do they decrease hazard. There was in 1914, throughout the country, a decrease in all classes of injuries in train accidents and it is known that the length of trains did not decrease in that period but rather did it increase, while the number of trains operated on the roads in general decreased, thereby decreasing the hazard.

The contention is made that with a shorter train there would be a better opportunity for the crew to make inspection of the running gear, brake rigging, etc. while stopping at points en route. In the first place, it should be clearly understood that on virtually every railroad today trains are made up in terminals by a yard crew, are inspected before leaving by car inspectors located at the terminal and then turned over to a road crew, which latter crew has nothing to do with the train until it is made up, inspected and ready to leave the terminal. As far as the more lengthy trains are concerned, the only stops made are, as a rule, to take water or at meeting or passing points. The men in train crews, like all other employes, are expected to live up to the rules which govern their work and the length of a train, no matter whether long or short, can not be accepted as an excuse for not making such inspections as may be required of them.

The longer trains must necessarily travel at slower speed than the shorter ones so that possibility of accident to the long train is decreased thereby.

As to the contention that accidents would result from drawheads pulling out on longer trains; while it is true that drawheads do pull out occasionally, it is an occurrence not confined to long trains and the truth of the matter is when they do pull out it is usually when the train is starting and at a time when no accident would occur.

I do not wish to be understood as finding fault with the employes of railroads as a class. As has been pointed out, the safety work on railroads is a co-operative work. The gratifying results which were obtained in the substantial accident reductions on railroads last year were largely brought about by the efforts of the men themselves who have grasped the spirit of the movement and attained an increased degree of thoughtfulness for personal safety. The problem of preventing accidents is mainly a psychological one. The man factor is the big factor in this problem. Every man entering the railroad service must be instructed and then examined and finally put out on the road. Oftentimes these men, who make a good showing in their examinations and tests, have concealed somewhere in them bad traits of character or habits of carelessness which are not discovered until an accident happens. This is a risk that is increased with every new man employed on a road. To suddenly increase the employes to the number that would be necessary to man the many additional trains the passage of this law would require would

mean another element of increased hazard instead of a decrease in hazards, because every green man that is employed is an experiment at the best. In fact, the real underlying object of this bill is to create jobs and increase employment unnecessarily.

For years the railroads have been expending vast sums of money in the interest of safety by improving equipment and conditions and installing safety appliances. This expense has included building steel cars, installing block signals, eliminating grade crossings and many other improvements for the benefit, not only of its employes and passengers, but the general public. To meet this continual growing expense, which, of course, is greatly augmented by increased wages and other items, it has been necessary for the railroads to adopt measures of the greatest economy and to secure the highest efficiency possible. As a general proposition the handling of a maximum amount of traffic at a minimum expense compatible with safe operation is an efficiency item of the greatest importance. If the railroads should now be required to limit the length of their trains to fifty cars, thereby multiplying the number of trains they must run, at a greatly increased expense for additional help, additional engines and additional fuel to run them, the money thus wasted would necessarily curtail the expenditures which would otherwise be made for real safety improvements.

In closing, let me reiterate that the railroads stand for safety as a basic principle and if this proposed law to limit the length of trains were in fact, as contended, a necessary measure to increase safety, there would be no strong opposition to it. But such contention is not sustained by facts. There is no reasonable argument in support of the measure while, on the other hand, facts and statistics clearly and unmistakably demonstrate that such regulation as this proposed law imposes would increase rather than decrease the risk of injury.

In view of all of these circumstances and considering the earnest, studious and expert work that the railroad officials are doing in the best of faith to prevent accidents and with the highest possible motive—that of conserving human life—the passage of such a burdensome, unnecessary and actually injurious law as this “short-train” proposition is would be to inflict upon the railroads, upon the public and upon the employes of the railroads themselves, a colossal injustice, for which there can be no excuse or reasonable explanation offered in palliation.

NOTE.—Bills to limit the length of freight trains were introduced during the past year in the Legislatures of nineteen states. In fourteen of the states the Legislatures adjourned without passing the bills. Such bills were still pending in five states on June 1, 1915.

LIMITING LENGTH OF TRAINS BY LAW*

BY M. W. POTTER,

PRESIDENT OF THE CAROLINA, CLINCHFIELD & OHIO.

A bill before the South Carolina legislature makes it a misdemeanor to run trains containing more than fifty cars, whether loaded or empty. The Clinchfield Railway never could have been justified as a sound business proposition and never would have been built, as a fifty-car railroad. More than \$15,000,000 was expended to increase its capacity to upwards of 100-car trains. The application of a fifty-car limit would double operating costs and actually destroy at least \$15,000,000 of our investment. If adopted in South Carolina the bill would prevent construction of new high-class roads and the revision of present lines. The measure would be an impregnable barrier against the progressive development of the state and permanently prevent the lowering of rates. . . .

With the completion of the Clinchfield extension to Elkhorn City, Ky., shortly to be put into operation, our line, in connection with the lines north, will constitute a practically level railroad from an operating point of view. All that will then remain to give South Atlantic ports a line to the Middle West equal to or better than the lines from the northern ports will be new construction from the Clinchfield to Charleston, or a revision and improvement of the present lines. This subject is now receiving the consideration of the lines interested.

The enactment of the proposed measure by South Carolina would build up and strengthen the railways of other states at the expense of your own.

"While such measures are prompted by a desire to create more jobs, the promotion of safety is given as a pretext. The statistics of the lines handling long trains conclusively prove that operation with long trains is safer than with short. A given tonnage can be handled over a line in a given time with a few long trains with much less danger than with a greater number of short trains. The reason is obvious. . . . By handling a given tonnage in fifty-car trains, instead of 100-car trains, there is four times the danger of erroneous train orders and signals; four times the danger of switches being left open; four times the sudden jars and wear and tear; four times

*From a letter printed in the Spartanburg (S. C.) Herald.

the danger of the flagman not properly warning approaching trains; four times the danger of congestion and collision, and four times the general complexity of operation.

Upon a hearing before the committee of the Virginia legislature, which last winter rejected a similar measure, statistics were furnished by the Norfolk & Western showing that the longer trains were the safer; and similar statements were presented by the Chesapeake & Ohio. It appeared that in the case of both these railroads the mere length of the train was negligible as a cause of accidents. The figures given as the actual experience on those railways harmonize with the universal experience of all railroads. The Clinchfield, which has been operating trains of from 60 to 135 cars in South Carolina for more than five years, has never seriously injured an operative in such service. We handle from 60 to 100 loads into Spartanburg and from 100 to 135 empties out.

Sound state policy would be to encourage development to the highest point of efficiency and the best possible service, with proper regulation of the compensation to be received for such service. The citizens of South Carolina should take this matter up as an important public question, which in its bearing upon the future of your state may, I believe, become as far reaching as any problem you have ever had.

SHALL THE GOVERNMENT OWN THE RAILROADS*

BY SETH LOW,

PRESIDENT OF THE NATIONAL CIVIC FEDERATION.

In his opening address at the Fourteenth Annual Meeting of The National Civic Federation, President Low devoted his attention chiefly to recent developments in the railroad situation, in their bearing upon national policies and the menace of government ownership.

Referring briefly to the efficient and useful work of the several departments of the Federation, Mr. Low described the preparation and passage of the Newlands Arbitration Law as perhaps the most significant work which has been carried to completion during the past year. The history of the Federation's part in this achievement was given in some detail in the last number of the *REVIEW*, and with it an account of the first arbitration held under the new law, that between the eastern trunk line roads and the conductors and trainmen. By request of both the railroads and brotherhoods, Mr. Low acted as chairman of this arbitration, which brought under review practically the whole field of operating costs, revenues and conditions of service.

In addition to this adjustment, Mr. Low enumerated twelve other controversies which have been settled or put in the way of settlement, through the United States Board of Mediation and Conciliation during the four months of the new law.

Arbitration is not necessarily a compromise, Mr. Low pointed out, but the fact remains that in the three principal arbitrations in the eastern territory the operating expenses of the roads have been heavily increased, and it is, of course, obvious "that a railroad cannot have its fixed charges indefinitely increased against its will unless it can at some time or another increase the rates which it will charge for service." Mr. Low then entered upon a discussion of these larger aspects of the problem as follows:

"The actual situation of the railroads, at the moment, seems to me so serious that, if this application for an increase of freight

*From opening address at the annual meeting of the National Civic Federation.

rates is declined, I fear the demand for the public ownership and operation of the steam railroads of the country will be inevitably strengthened. In a spirit of despair, men who know better will be apt to say, 'That is the only way'; and out of despair, I need not remind you, wise counsels seldom come. I make no apology, therefore, for pointing out briefly, on this occasion, some of the difficulties attaching to government ownership and operation of railroads in a country like ours, with a Federal government evolved as ours has been, covering half a continent. Such information as I can command leads me to believe that in Germany, France, Australia, Italy and Austria, the earnings of the state-owned railroads in each country barely equal, if they do equal, the sums paid in taxation by the railroads of the United States. The freight rates prevailing in those countries are uniformly higher, I believe, than the freight rates prevailing in the United States. In some cases they are more than double, but it is noticeable that the average passenger rate, disregarding the division by classes obtaining there, is lower in some, and, I think, in all, of those countries than here. This is largely due, no doubt, to the fact that multitudes there travel third class, and are given accommodations that would not be acceptable here.

"It is needless for my purpose to pursue this comparison into detail. What I wish to point out, is, that in our country, by reason of its vast extent and by reason of its Federal government, and its historic evolution, the problem, of public ownership, and, not less, the problem of public operation, are surcharged with difficulties that do not exist under different conditions. Leaving out of account altogether the difficulty of securing wise and economic management under the democratic conditions prevailing in the United States, the first point to emphasize is the difficulty of acquiring effective control of the railroads even if desired. Most of the railroads, if not all of them, are incorporated by the different States. This means that every railroad is given the authority by each State to operate within its own borders, and that every such road is equipped with the right of eminent domain to condemn land for railroad purposes within such state. What authority is to compel the States, or rather, what appeal is to induce the people of the various States to permit the railroads to surrender State charters in favor of national ownership; and in addition to grant to the national government authority to equip railroads so chartered with the power

of eminent domain in every state of the Union? Without such power of eminent domain it would be impracticable for railroads to be enlarged or for new roads to be constructed. If, on the other hand, each State were to absorb its own railroads, we should have a condition in this country out of which it would be impossible to bring effective unity of action and a railroad service operated for the general good. Imagine, for example, the New York Central Line from New York to Buffalo owned and operated by the State of New York and the Lake Shore & Michigan Southern owned and operated in fragments by the States of Pennsylvania, Ohio, Indiana and Illinois. Who can think for a single moment that the result in public service would be either adequate, economical or satisfactory? Moreover, if the national government, despite every difficulty, were to succeed in absorbing the railroads of the entire Union, every state would lose the control of its intrastate traffic that it now enjoys; and every state would lose all the income which it now collects from the railroads by taxation, because United States property is not subject to taxation in any state. Every state, therefore, in such a case, would be confronted with both an economic and a social problem, born of our Federal system, and the scale upon which these effects would be felt would greatly magnify the embarrassments.

"But, assuming for a moment that this great economic and social change had been sanctioned and actually put into force, try to imagine, if you can, how the conflicting interests of different parts of the United States could be harmonized when the same government is responsible for railroad operation everywhere. The annual bill for the construction of public buildings for the Federal government has acquired the popular name of 'pork-barrel' because it is so universally recognized that appropriations for this purpose are made to gratify local sentiment and to promote the interests of individual congressmen more than upon the merits of the matter, as determined by careful inquiry. What possibility is there that the administration of a system of national railroads would be, or could be, carried on under our democratic government in any other spirit? And in what possible way could the general interest of the people of the United States, in the matter of transportation, be less well served? Furthermore, the political consequences of centering such power in Washington are beyond calculation . . .

Our privately-owned railroads are themselves largely responsible for the strength of the popular feeling in the United States (in favor

of government ownership) . . . No doubt, the rebate system, so long practiced, accounts for most of this feeling. Happily, by virtue of the Interstate Commerce Law and the creation of the Interstate Commerce Commission, that which was a nation-wide abuse has become a rare exception, and it will become more and more rare. In other words, without public ownership, but through public regulation, we have substantially secured equality of treatment at the hands of the railroads for every shipper, large or small, in whatever state he may be. . . .

"It is hard to speak with moderation of the financial abuses connected with railroad management which have done so much to create and to strengthen the demand for the public ownership and operation of railroads. The public has seen railroads loaded with charges for the profit of individuals responsible for the conduct of the roads, charges which add permanently to the cost of transportation. Increases of value, largely created by the public, have been absorbed entirely for private benefit; and all of this has gone on upon so great a scale and for so long a time as to have cost railroad management, to a great extent, but often unjustly, both the respect and the confidence of the people. It is a case where the innocent suffer with and for the guilty. If government regulation can successfully put an end to these evils no doubt private ownership and operation of railroads may long continue in the United States; but, if government regulation falls short of being as effective in these directions as it has fortunately been in the ending of rebates, the tendency toward government operation, despite all its difficulties and dangers, is not unlikely to grow, unchecked. If the railroads wish to escape public ownership they must consent to the public regulation, for the future, of the issue of stocks and bonds; and it is greatly to be hoped that instead of placing every imaginable difficulty in the way of such legislation, they will cordially co-operate to see that effective and fair legislation to prevent repetition of the abuses of the past is quickly made a part of the law of the land.

One further observation is legitimate in this connection. If not completely, still very largely, the actual management of railroads in this country has passed, and is constantly passing, out of the hands of financiers and into the hands of practical railroad men who are less and less affiliated with the stock market. It is reasonable, therefore, to hope that we are passing out of the old era into a better order of things. The practical question also arises whether it is not

better now to "let the dead past bury its dead" and to turn with united and courageous front towards the better future. An attempt to uncover all of the past, and to try to do ideal justice now for wrongs that were committed long ago, is certain to be very costly to the country as a whole, as well as to the unhappy stockholders, who, without personal fault, find themselves involved in such a predicament. Mr. Evarts used to say that "there are vested wrongs as well as vested right," which was a wise man's way of saying that some wrongs are so costly to undo that it is better to leave things as they are than turn over a new leaf.

"There is one aspect of public ownership and operation which it seems to me legitimate to point out to the railroad employes who are so largely represented in our membership, and that is its probable effect upon wages. (Railroads that are publicly owned have available for wages only such sums as are appropriated by law. In a country of the vast extent of the United States that this difference is substantially certain in wages, as established by law, when they have once been fixed. Working conditions will also then be much more difficult to change than when the railroads are under private management. (The cost of living is so different in different parts of the United States that this difference is substantially certain to be reflected in an average wage below that which the railroads can pay under private management.) The agricultural interests of the country are enormous, and one of their greatest difficulties comes from the fact that agriculture cannot afford to pay as large wages as transportation and many other occupations pay now. This is, in fact, one great reason for the high cost of food products, that agriculture cannot command the labor that it needs in order to cultivate as it should, and to produce and to harvest larger crops. As long as railroads are privately owned, agriculture must take its chances; but, in this country, if railroads were publicly owned, the granges and other combinations of farmers would certainly be on the job to keep railroad wages as low as possible. They would have to be or they could not work their farms at all. (There is a rigidity about law that makes it difficult to change conditions once established; and it is equally hard, under the provisions of law, to take into consideration local qualifying conditions.) Such considerations as these satisfy me that railroad employes are not only better off now, under the private administration of railroads than they would be likely to be under public administration, but also that under existing conditions they can hope for a betterment in pay and rules of service which it would be vastly harder to realize from a Federal government constituted like ours."

PROSPECTS OF STATE OWNERSHIP IN ENGLAND *

BY W. M. ACWORTH

When I was invited last spring to address you this autumn on the subject of Railway Nationalization, none of us expected that we should be confronted with a *fait accompli*. Today the railways of this country, with unimportant exceptions—Ireland has got home rule in this matter—are nationalized. And it has been done so quietly that the man in the street doesn't know that it has been done, and that the porter in Queen street is at this moment a government official. But so it is, and it shows how easily the thing can be done. It may be undone—I don't think it will be—if two of the most influential men in the cabinet get their way, and induce their colleagues to see what a good opportunity the conclusion of the war would be for bringing forward a great scheme of social policy which cuts across normal political divisions.

But in any case, what has been done once can be done again. And it may be done again in the same way—taking over the whole thing as it stands by an interim arrangement and dealing gradually with knotty problems, such as the rights of the different classes of shareholders, the reorganization of the tariffs of the unified system, the right of state servants to strike, and so on—I only mention a few.

That nationalization of our English railways is bound to come I have long believed. That it will come pretty soon, I fully expect. Judging by the evidence before the Royal Commission now sitting, the great majority of the great manufacturers and traders of the country are opposed to it, the Leeds Chamber of Commerce among the number. But the captains of industry have few votes; the railway servants alone can vote them down; the trade union vote would simply swallow them. And I have no doubt which way the working classes, who expect the bottomless purse of the state to provide simultaneously higher wages, shorter hours, easier work and lower fares, would vote.

*An address delivered before Leeds Luncheon Club, Leeds, Eng., on November 16, 1914.

For my own part I shall greatly regret the change, which I believe to be inevitable. Not only because—

“Men are we and must grieve when even the shade
Of that which once was great has passed away,”

but because we shall lose, in my judgment, more than we can gain. I admit we shall gain something—a good deal perhaps. English business admittedly had grown slack—take the iron and engineering trades for instance—twenty years ago. Rule of thumb methods, antiquated machinery, neglect of cost accounting, and so forth, held undisputed sway. English business was effectually awakened by the severity of foreign competition. English railways are not exposed to foreign competition, and their methods still need modernization. The railway profession nowadays needs the best brains and high scientific training. Our railways mainly recruit their headquarters staff from the rank and file. The headquarters staff of the civil service are the pick of the very best brains of the country. I cannot doubt that nationalization would at the outset lead to more scientific and, therefore, more economical operation.

I will concede another point and a big one. No nation has yet solved the problem of satisfactory state control of a private railway system. Our railways used to be pretty well controlled by competition. But competition is dying before our eyes. There remain the Board of Trade and the Railway Commission. Nobody, I assume, supposes that they control the railways. The Royal Commission now sitting has shown no signs so far of having begun to think out a scheme of adequate control, or even of appreciating that such a thing is required. France used to have, under the name of *Comite Consultatif*, a really competent body of experts controlling its railways on the commercial side. But of recent years political pressure has greatly increased the membership of the committee till it has become an overgrown debating society, whose debates are not primarily conducted from the point of view of the public interest. As for America, high hopes were entertained not long since of the Interstate Commerce Commission. But its recent record has disappointed even its most fervent admirers. And at this moment the commission, having done its worst in impairing the credit even of the strongest companies, is occupied in eating with what grace it can a decision on the most important question ever submitted to it, which it pronounced after twelve months' inquiry as recently as last July.

Private railways must be controlled by the state. And when one admits that no state has yet discovered a satisfactory way of doing it, one may seem to have gone a long way in admitting the necessity of state ownership. And yet I still think that the balance of argument is definitely on the other side for two main reasons, financial and political. Though the doctrines of the Manchester school are out of fashion nowadays, it still remains true that the state cannot, or at least does not, conduct business as efficiently and economically as private enterprise. I have said that I believe that state management in this country at this moment would induce immediate economy. I have not said, and I do not think, that it would secure better public service. And I still believe that, if our railways remain in private hands, and have to work out their own salvation, they will be operated twenty years hence more efficiently than they ever would be by any government department. The largest part of the expenditure of a railway is the wages bill. Does anyone believe that the state gets as good value for £1 spent in wages as the private employer? Whether our English railwaymen are underpaid at present, I am not concerned to discuss. I only wish to point out that, under a state system, wages must go up sharply, and that the public will have to foot the bill.

It is in Prussia, if anywhere, that government railways are efficient. And yet I believe that any impartial expert, comparing Prussia with France, and taking into consideration the conditions, geographical, commercial, and economic, the service rendered, and the rates charged, would come to the conclusion that the French companies, hampered though they are at every turn by political interference, are managed more efficiently and economically than the Prussian state system. As for the exploits in disorganization of the French government since it took over the Western Railway, it is only kind to draw a veil over them, and say that things have been so bad that it is impossible that they should not get better. But, if the Prussian state cannot hold its own with the French companies, still less can the Australasian state railways face comparison with American companies. Comparing the efficiency of the Victorian or New South Wales railways with that, I will not say of the Pennsylvania, but of the Southern Pacific or even the bankrupt St. Louis & San Francisco, would be as absurd as comparing a blunderbuss with a Lee Metford.

Even more important to traders than the quality of service given is the scale of rates charged. If our railways are nationalized they

will need to earn much the same net revenue as at present; or else saddle a deficit on the taxpayer. Private companies naturally try to raise the necessary revenue with the minimum of economic friction. Their motto is "Charge what the traffic will bear." Drop the rates where the traffic cannot bear them; keep them up where the traffic can. Their goods manager is from his situation impartial between rival claims. By training he is an expert to know where the shoe most pinches. The state instinctively tends to broad general views and a dead level of uniformity. And, in practice, at least in a parliamentary country, adjustments towards uniformity can only be downwards. And this means that certain individuals, in no way specially meritorious, will secure increased profits at the expense of the general public. Under a state system I have no doubt that rates would be reduced to a dangerous extent. It is emphatically untrue that reduction of rates always increases net revenue. If it were true, why do not the commercial companies reduce rates today? The famous apple woman who could afford to sell each apple at a loss because she sold so many lived in Ireland. And Ireland is an exceptional country.

I have left to the last what is in my mind the final and crucial point—politics. Under a state system, to quote the words of the famous Italian commission of thirty years ago, "Politics would corrupt the railways. And the railways would corrupt politics." The Italians since then have put the question to the test of experience, and have abundantly proved that the commission was right. I cannot attempt to give you the evidence. It is to be found all over the world, from Belgium and France to Argentina and Peru. Some samples culled from the records of our own Australasian colonies will be found in Sir Charles Owens' evidence before the Royal Commission. I have myself called attention to evidence from Canada and the Cape to the same effect. It is safe to say that no democratic state has ever yet succeeded in keeping railway management out of politics. In my belief no democratic state ever will. And it is because I believe that politics would corrupt the railways and railways would corrupt politics, not necessarily through money bribes but through the worse and more insidious bribery of votes, that I shall oppose government ownership of railways in England as long "as the question remains an open one. But I fear I shall live long enough to say, "I told you so."

OBJECTIONS TO GOVERNMENT OWNERSHIP OF RAILROADS*

BY HON. JONATHAN BOURNE, JR.

Mr. Chairman and Members of the National Civic Federation :

The desideratum of all government should be the protection of its citizens and only such restraint of individual action as is absolutely necessary to insure the desired protection of all its citizens.

The limit of the individual's restraint should be clearly expressed by law and not left to the whim or fancy of an executive, a commission, a department or a bureau.

A government of rule and regulation, a bureaucratic government such as ours is rapidly trending toward, cannot long endure.

I am strongly opposed to government ownership of railroads because of the following three objections :

First. The fundamental objection that it would be absolutely destructive of popular and representative government.

Second. The unanswerable objection that government ownership necessitates government regulation ; that the failure of government regulation necessitates the failure of government ownership ; that the success of government regulation eliminates the necessity or desirability of government ownership.

Third. The economic objection that government ownership would be more dilatory, less efficient and far more costly to the people of the country.

SELF-INTEREST GOVERNS DELIBERATED ACTION.

All government, society and business are composed of human units and directed by the forces controlling human action. Hence in approaching governmental problems, we should carefully analyze these forces. Where any individual is called upon for immediate action many forces, such as sentiment, love, passion or hatred may determine the action. I am convinced that every deliberated action of any individual in his primary capacity is controlled or influenced by the individual's opinion as to the effect such action will have upon his own personal selfish interest. If this be true, then the less power delegated to single individuals in government the better for the interests of those governed.

*From address before the National Civic Federation, November 4, 1914.

There are no two people in the world exactly alike, and probably there never will be. Hence each individual has a different viewpoint as to what constitutes his own selfish interest. Under community action no individual can secure gratification of his own selfish desire, but must rest content with what the majority of the community believe to be for the best interest of all. Therefore the more you force the people to act collectively, the more you can distribute governmental power, the better the general welfare of the community governed.

In all organized society there are three great forces continually struggling for supremacy: the police force of government, the religious force and the commercial force. The best government would be correlated action between these forces, but with domination of the police force over the religious and commercial forces.

The people as a whole and not any individual should constitute the police force of government. No individual should constitute a government. Our whole political organization is founded on this idea; and yet the present trend of this country, or at least of the present administration and some previous ones, has been toward centralized government, with practically plenary powers in the hands of the executive, or department or bureau heads.

The evil results of the police force, commonly called the State, being represented or dominated by a single individual, are today most forcefully and horribly illustrated in the European situation, where one man by virtue of his occupancy of a throne has involved four hundred million people in a continental war, resulting in the slaughter of millions of men, the destruction of billions of dollars' worth of property, and cessation of industrial activities with resultant economic waste beyond human comprehension. Had the policies of European nations been left to legislative bodies rather than to individual monarchs the situation which now exists could not have been developed.

Selfishness and ambition so generally control human action that great delegated power must always be a menace. It is certainly axiomatic that centralized power in an individual or commission can only produce results commensurate with the integrity, ability, experience and unselfishness of the individual or individuals constituting the commission.

GOVERNMENT OWNERSHIP MEANS CENTRALIZED POWER.

Returning to my first objection to government ownership of railroads, I assert that it would be absolutely destructive of popular

and representative government. (The ownership of railroads would be quickly followed by ownership of telegraph and telephone lines, express companies, water transportation companies and electric railways doing an interstate business.) I am opposed to government ownership of any of these public service corporations.

I present herewith a table I have prepared giving the number of employes, for the years specified, of the United States government and of the different public service corporations, showing a total of 3,054,988 employes.

1914—Number of Government civil employes.....	469,000
1912—Telephone and telegraph employes.....	220,656
1913—Railway employes.....	1,815,239
1912—Electric and street railway employes.....	282,461
1906—Water transportation.....	188,348
1907—Express employes.....	79,284
Total.....	3,054,988

Reflect over these figures. Remember that in the last ten presidential elections the President has been chosen by a plurality varying from a little over 7,000 to about two and a half millions.³ (Can any person familiar with the politics of this country doubt the correctness of the assertion that, under government ownership of these public service corporations, with the resultant addition of ~~over two~~ and a half million employees to the government pay roll, those employees and their friends would inevitably control the government under our political machinery.) The tendency would be more pay and less service in governmental employment, resulting in ceaseless efforts on the part of outside labor to secure government employment because less onerous and more remunerative, with cumulative dissatisfaction and irritation in all private enterprise.

In the past, Presidents have been able to dictate the nomination of their would-be successors, either themselves or others, because of subservience to the executive of the great number of Federal office holders. While it is true that universal adoption of presidential primaries would minimize the possibility of repetition of this misuse of power in the future, yet, even under a primary system, the existence of over three million employes, subject to removal, promotion, transfer or demotion by executive order, would give a political power that should not be delegated to any single individual if the government is to last.

WOULD THROW RAILROADS INTO POLITICS.

Advocates of government ownership urge that the taking over of the railroads by the government would eliminate them from politics. In my opinion it would have the opposite effect, throwing them into politics.

The assertion that the railroads are now a positive factor in politics is untrue. Undoubtedly there was a time when railroads and other large corporations exerted a very large and very effective influence upon state and national politics, but that time has passed. The direct primary has overthrown the power the corporations had under the old convention system, and the people have the power today not only to select between candidates, but to choose the candidates as well.

(Government ownership would be followed by organization of government employees for the promotion of their own interests. These employees would immediately become an organized factor in every campaign. Their influence would be exerted, not primarily for the promotion of the best interests of the country, but for the promotion of their own interests. Their influence would be thrown with the party or candidate that promised most for the fulfillment of their desires.

So long as the party in power kept on good terms with the three million government employees, it would have their support, and the support and co-operation of their relatives. While it would be absurd to argue that any such body of men would act as a unit at all elections, it is altogether probable that a sufficient number of them would so act as to make them a formidable political organization.

An administration backed by an active organization spread throughout the length and breadth of the country would thereby have a tremendous and practically overwhelming advantage over the party seeking to supplant it.

The establishment of classified civil service rules and regulations would not remove the menace to truly representative government. Even though appointments be made in part in accordance with competitive tests, the fact that chief officers of the party in power have control over promotions, demotions, transfers and removals, would make the individual governmental employee subservient in politics, except where practically the whole body of employees acted in accordance with prearranged plans for the benefit of the employees themselves.

DISTRIBUTION PREFERABLE TO CENTRALIZATION.

Our government was founded upon the principle of distribution, rather than centralization of power. The framers of the American Constitution provided for three branches of government, the legislative, executive and judicial. The legislative branch, composed of a large number of individuals, was designed to be the dominant branch, for it was vested with the law-making power. The judicial branch was designed to interpret and the executive branch to execute the laws enacted by Congress.

But in practice we have drifted far from the principles adopted when the government was founded. Ours is a representative form of government, generally conceded to be the best thus far evolved by the brains of men, because it is a government of, for and by the people. Yet, especially in the past two years, our tendency has been, in my opinion, entirely contradictory of the theory upon which our government was constructed, and, unless checked, must result in absolute destruction of representative government.

Some political leaders seem to have gone commission mad. Every social and economic problem, in their view, calls for the creation of a new bureau or department or commission with power to make rules and regulations for the government of the American people. Congress, the legislative body of the Constitution, is becoming but an instrumentality for the creation of bureaus and commissions vested with the real law-making power. The citizen of today, who wishes to know what he can or can not do within the law, consults not merely the statute books, but the latest pamphlets of rules and regulations adopted by some department or bureau head or commission.

While I believe the Interstate Commerce Commission has accomplished and is accomplishing much good; have favored its receiving the power to regulate railroad rates; yet I realize that it is yet to be demonstrated whether the powers it already has should be enlarged or curtailed, and I am appalled at the realization that the legislation of the past two years has so centralized government as to place the interstate business of this country practically in the hands of nineteen men, or possibly of eleven; the Interstate Commerce Commission, consisting of seven members, or a majority of four, practically determining rates affecting the welfare of the whole nation; the Federal Reserve Board consisting of seven members, or a majority of four, practically determining currency expansion or contraction affecting all business of the country; the Trade Commission, con-

sisting of five members, or a majority of three, that will practically dictate the policies of 160,000 of the large corporations of this country, with the inevitable result that attempts will be made to use these boards as political machinery for the advantages or disadvantage of some administration and ultimately of some individuals.

REGULATION NECESSARY UNDER GOVERNMENT OWNERSHIP.

Proceeding now to a consideration of my second objection:

It is strange that the advocates of government ownership, who assert the failure of government regulation, overlook the fact that government regulation is just as essential under government ownership as it is today. If the Interstate Commerce Commission must be charged with the duty of regulating rates, supervising provisions for protection of life, and guarding against favoritism and discrimination, surely all these duties must be performed under government ownership.

The conflicting interests of competing shipping points would exist under government ownership just as they exist today.

Every section of the country and every industry would be before the managing board of the government railway system asking for reduced rates on certain commodities, or between certain points.

Every community would be before the board asking for improved service, improved equipment and extension of lines.

Where the Interstate Commerce Commission has one problem to solve now, it would have ten under government ownership.

It cannot be expected that discrimination will be eliminated under government ownership. Those who anticipate any such form need only recall the serious differences that have arisen already in the Federal Reserve Board over the effort of the Secretary of the Treasury to extend special favors in financial matters to one section of the United States.

DISCRIMINATION IN GOVERNMENT SERVICE.

Another proof that we would have discrimination—unfair discrimination—under government ownership, may be found in the records of the Post Office Department, where such discrimination has been practiced. In 1910 Postmaster General Hitchcock ordered the establishment of what is known as the "Blue Tag" service, under which certain publications were ordered transported on freight trains, while rival publications of very similar character and competing for the same trade, were continued in the mails.

Please remember that although these magazines which were ordered transported on freight trains paid exactly the same rate of postage and were admitted to the mails under exactly the same laws as those that were continued on fast mail trains, yet they received, under the Postmaster General's deliberate order, a far less efficient character of service.

When such a discrimination can be made in the postal service, who can doubt that there would be similar discrimination under government ownership and operation of railroads.

Government ownership of telegraph and telephone lines would result in intermittent press censorship and continuous press subservience to the administration in power, thereby utterly destroying our zealously guarded "freedom of the press."

Discriminations no doubt exist to some extent today, but they have been reduced to a minimum. The point I wish to impress upon your minds is that government ownership would not relieve the country of the necessity of government regulation.

If government regulation is a failure today, we have no good reason to believe it would be a success under government ownership. We cannot hope to secure for the management of a government owned railroad system men who are more honest or more capable or more aggressive in the performance of their duty than are the members of the Interstate Commerce Commission and the officers of the Department of Justice.

If they cannot succeed in enforcing the law and in preventing discrimination, we cannot expect them to establish and maintain equitable service under government ownership.

If a member of the President's Cabinet will undertake to favor one section of the United States in the operation of a currency and banking law, some other member of the President's Cabinet would attempt to favor some section of the country in the management of government railroads under his control.

Therefore, I assert again that if government regulation is a failure, government ownership will be a failure, and if government regulation is a success, the reason for government ownership is eliminated.

GOVERNMENT SERVICE MORE EXPENSIVE.

The economic objection to government ownership is the one I deem of least, and, in fact, of very slight relative importance. I am not one of those who think that government ownership would lead to financial disaster, or ruin of the transportation service, or the

destruction of internal commerce. I have no doubt whatever that the government could acquire the railroads, operate them with a fair degree of success, inaugurate some reforms and save some waste through the elimination of duplication. But I am also convinced that while the government, as the owner and operator of the railroads, would likely inaugurate improvements in some respects, these would be more than offset by deterioration in the service in other ways, and that the economies accomplished by elimination of duplication would be more than counterbalanced by increased expenses in other respects.

It seems to me to be absurd to argue, as some gentlemen do, that the government could take over the railroads, provide better equipment, install the most up-to-date and expensive appliances for the protection of employees and passengers, increase the wages and reduce the hours of employees, and at the same time give service as good as now rendered at a less cost.

That every practicable precaution should be taken for the protection of life, no one will question. This, as I understand it, the Interstate Commerce Commission now has the power to require. I have no doubt whatever that it has ordered the installation of protective equipment as rapidly as it is deemed practicable.

Undoubtedly there is some waste in the present system of management because competing roads maintain more frequent train service than is necessary between certain points, through an effort on the part of each to secure as large a share as possible of the traffic. The elimination of some of the trains would mean a somewhat reduced service, a correspondingly reduced cost and a consequent saving. I can not agree, however, with those who believe that this reduction in service, due to the elimination of competition, and reduction of supervisory organization in the management due to the consolidation of all the railway systems into one, would effect any economy whatever, when allowance is made for the increased number of employees incident to government ownership. That it costs the government more to perform service than it does a private concern is so generally recognized that it requires no demonstration.

Under present conditions, passenger and freight rates are practically uniform on competing lines and the only competition is in the matter of service. The effort of the managers is to secure a larger portion of the traffic by providing superior facilities and rendering superior service. With the elimination of competition under government ownership, this incentive would be entirely removed. At

the present time, every employee is urged by his superiors and compelled by his own desire to retain his position and secure promotion by demonstrated ability, to put forth every effort to secure business for his company by offering the traveler and the shipper the best service practicable. Under government ownership that incentive would be removed. The employee would perform his routine service with faithfulness, no doubt, but without putting forth unusual effort.

One of the arguments made in behalf of government ownership is that it would mean increased compensation to railroad employees. That this result would be realized, no one will question, nor shall I assert that it ought not be realized. What I do contend is that the advocates of government ownership who base their arguments upon economic reasons, err in their contention that the government can both increase compensation of employees and reduce the cost of transportation to the shipper.

The average compensation of the present railway employee is about \$723 per annum. The lowest salary paid to the railway mail clerk, during the first year of his employment, when he is performing practically unskilled service, is \$900 per year. The average compensation of the railway employee is therefore below the least compensation of railway mail clerks in the employ of the government.

If the average compensation of railway employees should be increased one-third, which is a very conservative estimate of the increase that would be experienced under government ownership, the total addition to the compensation account would be \$400,000,000 annually—the present pay roll of the railroads amounting to over \$1,200,000,000 in round numbers.

GOVERNMENT SERVICE LESS EFFICIENT.

My assertion that government ownership would be less efficient is based to a large extent upon a personal experience I had some four years ago. On December 21, 1910, by the adoption of a resolution which I introduced, the Senate called upon the President to inform the Senate as to the total number of officers and employees of the government, exclusive of enlisted men of the army and navy. Sixty-five days elapsed before the information was transmitted to the Senate, it being received on the evening of February 24, 1911.

While waiting for the receipt of this information, I became curious to know how long it would take large corporations to supply similar information regarding their own service. I therefore ad-

dressed letters to the Standard Oil Company, United States Steel Company, and the Western Union Telegraph Company, asking them how long it would take them to supply the information. The Standard Oil Company replied that it could supply the information in three days; the Western Union could supply it within a few days. I received no response from the United States Steel Company.

It was a cause of great surprise to me that it should take the departments of the government, all located in Washington, sixty-five days to inform the Senate as to the number of their employees, when all appointments are made from Washington and all pay rolls audited there.

The Post Office Department and its service is frequently lauded, especially by Postmasters General and their assistants, for its efficiency and economy. Let us analyze: Mail is deposited by citizens in post offices and letter boxes, picked up by postal employees, carried to assembling points, routed for destinations, delivered to privately owned railroads, transported by them all over the country; received by postal employees and distributed in post office boxes or by carriers to the addresses. Could this service be performed without the privately owned railroads? Is the Post Office Department entitled to sole credit for this activity? Are not the railroads entitled to some credit for safe and expeditious transportation all over the country, especially when public opinion compels them to carry the mail, and at rates which I am satisfied after two years' special study of the subject are too low?

I have no desire to minimize the credit due the postal mail collectors, clerks and distributors, yet comparison with large mail order houses, where I have known a mail order for twelve different articles from eight different departments to be filled, with the packages on the platform at the car within four hours from the time of the receipt of the letter containing the order, shows an efficiency and organization in the mail order house that does not exist in the postal department, because of better executive direction in the former than exists in the latter.

The head of a mail order house or other large business establishment engaged in distribution devotes his time to increased efficiency, better service and intelligent economies, while a Postmaster General's time is too apt to be consumed in an effort to build up a political organization by the distribution of nearly 60,000 post offices among the faithful followers of the administration.

Successful private business is run on the merit and promotion plan, while we are prone to run the government on the demerit and demotion basis.

STATISTICS UNRELIABLE.

In this discussion I make very little use of statistics, for it has been my observation and experience that statistics are very unreliable and are very likely to be misleading, even when used with the best of intentions. Statistics are quite frequently derived from a prejudiced source and usually selected and used to support preconceived ideas.

Let me elaborate a little on my statement that I have found statistics unreliable.

You will all remember that the Postmaster General of the last administration declared in his last annual report that he had succeeded in placing the Post Office Department on a self-supporting basis and had a surplus of \$219,000 as proof. The first report of his successor, the Postmaster General of the present administration, challenged this statement and asserted that the apparent surplus was produced by a "faulty method of accounting," and that instead of a surplus there was in reality a deficit of \$732,000.

I shall not take your time to enter into a discussion of the relative merits of the two assertions which involve a difference of \$951,000. It is sufficient to know the indisputable fact that one of the Postmasters General was wrong. The incident serves to illustrate not only the unreliability of statistics, but the probability that government statistics are manipulated to suit the purposes of the management of the department.

Just as it was to the interest of the Postmaster General of the last administration to make a bookkeeping showing a surplus in the management of the department of which he was the head, so it is to the interest of the management of government owned railroads of every country in the world to make the record show successful management. Because of the personal interest of those in control, the statistics which they make public should be viewed with care and accepted as true only after the most thorough scrutiny.

It is not necessary that statistics be inaccurate or used with dishonest intent in order to be misleading. Correct figures may be used with the utmost good purpose and yet lead to erroneous inferences.

For example: In an article in the *Saturday Evening Post* of June 6, 1914, Governor Stubbs said:

"During the year 1913 the railroad companies of the United States received in revenue \$3,171,000,000. There are in this country approximately twenty million families of five persons each. The average cost of living for these families last year was approximately \$625 each. Railroad transportation cost each of these families an average of \$158.50, or a quarter of its total expense."

Later Mr. Stubbs refers to this railroad revenue as a "tax." While Mr. Stubbs does not say in express words what conclusion he wishes drawn from his use of these figures, the unexpressed inference is that each family was mulcted to the extent of an average of \$158.50 during the year.

In a reply to the Stubbs' article, President Ripley, of the Santa Fe, presented what he termed a "*reductio ad absurdum*," in which he enumerated nine items of family expense which totaled \$12,848,000,000, or an average of \$642.35 per family. These items did not include food, clothing or rent, yet they exceeded the total average cost of living.

The thought that occurs to me in connection with the manner of presentation which Mr. Stubbs has adopted is this:

If a computation of the average revenue of the railroads per family is pertinent to a discussion of government ownership of railroads, why is it not also pertinent to compute the average railroad expenditure per family? If the railroads are to be charged with the revenue collected, why not credit them with the money expended?

I have not at hand the documents from which Governor Stubbs secured his statistics as to the total revenue of the railroads of the United States. I have here, however, the text of the 1912 report of the Interstate Commerce Commission, covering the financial operations of 246,828 miles of roads that reported to that body. The report does not state the amount of the total income of the railroads, but by addition I ascertain that the report shows for this mileage of roads a total income from all sources of \$2,995,596,275, or an average of almost \$150 per family, assuming that there are twenty million families in the United States. These same roads paid out for wages, supplies, taxes, interest and dividends a total of \$2,942,682,321, or an average of over \$147 per family. The remainder of the income was spent for additions, betterments, new lines, extensions and reserves.

In this connection the following table on ton-mile revenue and distribution may be interesting to some:

Average receipts per ton-mile.....	0.744 cent
Distributed as follows:	
Wages	0.321 cent
Material and supplies.....	0.200 cent
Taxes	0.030 cent
Rentals (net).....	0.012 cent
Interest (net).....	0.108 cent
Balance for stockholders, to cover adjustments, improvements, dividends and surplus.....	0.073 cent

The average rate of dividend on all railway stock in 1912 was 4.64 per cent.

The average rate of interest accrued on all railway funded debt in 1912 was 4.22 per cent. This represents interest legally accrued and charged by the railways to their income account, whether the interest was actually paid to the bondholders or not. In other words, this covers interest defaulted as well as interest paid. If the amount of defaulted interest could be ascertained and subtracted from the total amount of accrued interest, this rate would unquestionably be somewhat smaller.

Personally, I see nothing pertinent in the computation of the average railroad revenue per family, but, if there is any force in the presentation of the figures as to income, I submit that the average railroad expenditure per family is just as pertinent and the averages are so nearly the same as practically to counterbalance.

EXAMPLES OF DEPARTMENTAL VACILLATION.

In 1879 Congress directed the Postmaster General to secure from the railroad companies transporting mail certain information relative to operating receipts and expenditures, the purpose being ascertainment for proper compensation for railroad mail transportation. Intermittent attention was paid to this Congressional direction, and in 1907 a departmental commission of five was appointed by Postmaster General Cortelyou. Over 140 questions were prepared and propounded to the 795 steam railroads then carrying mail.

It cost the railroads \$250,000 to furnish the information and the government a direct out-of-pocket cost of \$19,423 for tabulation of the information contained in the railroads' answers which is set forth in Document No. 105, 62d Congress, 1st Session, and reported to Congress August 12, 1911. Accompanying said document was a suggested draft of a bill endorsed by Postmaster General Hitchcock,

accompanied by a letter conveying the impression that the result of the adoption of such legislation would be a saving to the government of about \$9,000,000 in railway mail pay.

Here we have a concrete result of four years' research work in a department at a total expense of practically \$270,000—a good investment if the many departmental examples of pitiful vacillation, unreliable data and estimates cause Congress to check all departmental figures and decline to follow blindly departmental suggestions.

Study of the bill showed that Mr. Hitchcock and his assistants had failed to realize that rights of way, road beds, track, equipment and terminals were necessary prerequisites in the operation of mail cars, for in his method of payment he had made no allowance whatever for capital charges, recommending that the government only allow 6 per cent on the ascertained cost to the railroad companies for carrying the mail, and his predicted \$9,000,000 saving to the government was based entirely on this premise.

Fortunately Congress had created a Joint Congressional Committee which made an exhaustive study of the subject. With tardy realization of the absolute fallacy and injustice of his first suggested plan, Postmaster General Hitchcock, on January 23, 1913, submitted a second draft of bill for regulation of railway mail pay. Study of this plan by the Joint Congressional Committee soon demonstrated that the plan was practically unadministrable and certainly undesirable.

On February 12, 1914, a third plan, in the nature of a tentative draft, was submitted, and the Joint Congressional Committee was soon satisfied that same was unscientific and most undesirable, giving unnecessary and dangerous powers to the Postmaster General and containing rates which, if adopted, would be absolutely confiscatory.

The Joint Committee's demonstration and the ultimate realization on the part of the Department of its mistake in its third bill resulted in the submission to the House of Representatives of a draft of what is known as H. R. 17042, introduced in the House of Representatives on June 4, 1914, Sections 13, 14 and 15 of which cover "Compensation for the Transportation of Mail." The Joint Congressional Committee again demonstrated the department's suggested rates under its new plan to be absolutely confiscatory.

Here we had four departmental plans suggested and urged for enactment within a period of three years, each differing from the others in fundamental features, but all seeking further dictatorial

and plenary powers for the Postmaster General. Do you expect successful government ownership of railroads under such a vacillating management as that?

During the nearly two years' study made by the Congressional Joint Committee the department presented estimates of annual overpayments to the railroads to the amounts of \$9,000,000, \$10,531,792, \$1,615,532, \$319,832 and \$221,832. Many other instances of very inadequate and unreliable statistics furnished by the Post Office Department during this investigation could be cited.

POSTAL STATISTICS ERRONEOUS.

Very similar was the experience of a Congressional Committee between 1898 and 1901, when the department submitted statistics that the railroads were paid on an average of 6.58 cents per pound for transporting mail, averaging 40 cents per ton-mile, with an average haul of 328 miles, whereas a special weighing demonstrated that the average payment was, in fact, 2.75 cents per pound, averaging only 12.56 cents per ton-mile, with an average haul of 438 miles.

Commenting upon these statistics, Congressman Moody, afterwards a Justice of the Supreme Court, said:

In other words, we were not paying one-third as much as the Post Office Department had led the people of the country to believe we had been paying.

The commission appointed in 1911 to investigate the subject of postage on second-class mail matter, of which commission Justice Hughes, of the Supreme Court, was chairman, had a similar experience. It repeatedly found the statistics submitted by the Post Office Department to be erroneous and the department changed its figures when compelled to do so by demonstration of their inaccuracy. So glaring and numerous were the errors that the commission commented upon them as follows:

It seems hardly worth while to include subsidiary tables from which these results are taken or to criticize the details, as the commission has little confidence in their accuracy.

I have made frequent references to the Post Office Department, not through any desire to specially criticize that department, but because the postal service is the only government activity which corresponds with the government ownership and operation of railroads and furnishes the only demonstration based upon experience of what we might expect under government ownership of railroads and other national public utilities.

REMEDY FOR EXISTING EVILS.

I recognize the fact that evils exist in every line of human activity and that remedies must be provided. My own theory is that government should leave as large opportunity as possible for individual enterprise and industry, holding out as an incentive the assurance of enjoyment of the rewards of legitimate endeavor. In order that opportunities may be equally open to all, wrongful acts must be prohibited by criminal statutes which should impose penalties so severe and make punishment so certain that violation will be extremely rare. This assurance of a large degree of liberty and also definite restriction upon improper action should not depend upon the varying whims or prejudices or even the sound judgment of bureau heads, but should be prescribed by act of the law-making body established by the constitution, so that every citizen can read in the plain language of the statute the extent of his rights and the limitation upon his liberty.

No one will condemn more severely than I the wrongful acts of corporation managers who have pillaged their stockholders or wrecked the institutions over which they had control. Deeds of such character should be made criminal by law, if not already so defined, and prison doors should swing open to receive and confine the culprit who is unfaithful to his trust.

But eradication of evils of this kind does not require government ownership. There is no need to stifle individual enterprise, ambition and energy in order to prevent repetition of wrongful acts. Advocates of government ownership propose a remedy worse than the disease. In the misguided effort to cure evils in railroad finance, they would fasten upon the nation evils far more serious, far more insidious, more deeply affecting the welfare of present and future generations, striking at the very vitals of truly representative government.

For my part, I have not lost confidence in government by law. I am not convinced that the crooks in railroading so far outnumber the honest men that elimination of the dishonest is hopeless. The day is not near so dark nor the prospect so gloomily as some would have us believe. There is still a preponderance of good among the American people and we have not yet reached the time when we must write upon the pages of our history the declaration that we shall buy the railroads because we cannot control the crooks.

THE WORLD'S EXPERIENCES IN GOVERNMENT OWNERSHIP

BY RICHARD HOADLEY TINGLEY,
IN THE SANTA FE MAGAZINE.

Of the seventy-six separate political organizations that go to make up the independent nations and colonial dependencies of the world, forty-four already have declared themselves, as a matter of practical politics, as being in favor of complete or partial nationalization of their railways by taking over and operating some considerable portion of the mileage within their borders. In the balance, thirty-two, all the railroads still are privately owned. Conspicuous in this latter class are the democratic governments of Great Britain and the United States. In both of these nations the question is now being agitated.

Martin A. Knapp, the then chairman of the Interstate Commerce Commission, said in 1902: "For the government of the United States to acquire the 200,000 miles of railway already constructed, undertake to conduct their vast operations by direct agency and to extend the service with needful rapidity, is a project of such colossal import as to incline us to place it quite outside the range of probability."

Ten years later, when the railroad mileage had been largely increased, Franklin K. Lane, also then a member of the Interstate Commerce Commission, said: "No one who has had experience in governmental affairs will be bold enough to say that the government of the United States could now operate the 250,000 miles of railways with as much satisfaction to the people as the railroads themselves are now being administered."

It is the purpose of this article to review briefly the history of the government ownership idea, to give an account of the success or failure of the experiment in this and other nations, and to draw some conclusions from the facts so found. The writer desires to say that he holds no brief from either government or railroad; that he entered upon the study of this subject many years ago, with an open mind devoid of prejudice, from the standpoint of a practical railroad engineer and operator, and that his conclusions are the result of long experience in the promoting, engineering and operating of railroads and utilities properties.

It is probably not very well known that this country has had quite an extended experience in building, owning and operating railroads. In the early days of railroading the "sovereign state" was considered the only medium strong enough or sufficiently well qualified to cope with such large affairs. Many of our states entered the railroad field, some to their ultimate profit, others eventually to shoulder heavy losses. The fact, however, that out of the many hundreds of miles built and operated in the past by the various states not a single mile is now so operated (with the exception of thirty-two miles in Texas, used as an adjunct to its penitentiary system) would not of itself appear to be a very conclusive argument in favor of the Federal government assuming the operating role.

Former Governor Stubbs of Kansas in a contribution to *The Saturday Evening Post* (June 6, 1914) brought out a very large number of what were supposed to be arguments in favor of government ownership of our railroads. Governor Stubbs quoted figures and made comparisons in support of his arguments, many of which were palpably overdrawn and inaccurate. Among other things the governor made the following statement: "No railroad system once taken over by the government has ever been permanently returned to private ownership." In what follows it will be shown how nearly correct this statement is. It will be shown that in the past many of the states of this country have operated railroads that are now being operated by private corporations, and it will be shown further that in no instance was state operation successful.

The North Carolina Railroad Company was incorporated in that state in 1849, and during the next few years built some 223 miles of line from Goldsboro to Charlotte. The state owned a large majority of the stock, built the road and operated it until 1871, when it was leased to the Richmond & Danville Railroad (now part of the Southern Railway). The state now derives a good yearly income from the stock which it still owns in this road. North Carolina also built and was at one time sole owner of the Western North Carolina Railroad, 185 miles from Salisbury to the Tennessee line. This road was state owned and operated from 1875 to 1880, when it was sold to a private company and afterward passed into the hands of the Southern Railway, the state having now no interest in the ownership. North Carolina built a third road, from Goldsboro to the coast, 95 miles. This was called the Atlantic & North Carolina

Railroad. The state owned (and still owns) two-thirds of the stock of this company and had absolute control of its operation from the time of its completion, about 1856, until 1904, when a 95-year lease was entered into with a private company. This lease shortly afterward became the property of the Norfolk & Southern Railroad, and the road since has been operated as part of that system, the state deriving a handsome income from its stock holdings under the lease.

North Carolina presents perhaps the most striking example of state ownership and operation that this country affords, both in length of line operated and in length of time as well. At one time it had something more than 500 miles of operation on its hands, and for nearly half a century it operated the 95 miles from Goldsboro to the Atlantic. Since 1904 it has had no interest in these operations other than to draw its interest and dividends. That the experience of this state so far as operation is concerned was unsuccessful nobody attempts to deny. On the other hand, as a result of the retention of ownership while the lines are being operated by experienced private corporations as business enterprises, the state is receiving substantial benefit.

According to Judge Womack of that state, nearly the entire bonded debt, amounting to more than six million dollars, was the result of obligations incurred for railroad purposes, and it is believed that the present value of the railroad stocks owned by the state amounts to considerably more than this figure. The writer was employed by the lessee of the Atlantic & North Carolina Railroad in 1904 to make a physical valuation of the property and to superintend the reconstruction of the line. The writer feels that he is in no danger of contradiction when he makes the statement, based on personal observation, that state operation of this road was a failure.

The experience of Missouri in railroad ownership and operation is rather a sore point. Missourians do not like to have the subject mentioned. According to C. M. Keys of the Wall Street Journal, this state had a hand in owning, financing and operating several of its lines—the Hannibal & St. Joseph, the St. Louis, Iron Mountain, the Cairo & Fulton and the Pacific Railroad. The resulting net loss was nearly twenty-five million dollars. High finance in this border state was well understood in those early days. Mark Twain was well advised when he wrote “The Gilded Age,” and Governor Stubbs, living so near Missouri, should have known about it. All these properties are now prosperous. They form integral parts of

big western systems. Missouri made no mistake in selecting the line it would own and operate, but Missouri did demonstrate, at least to its own satisfaction, that it was unprofitable for a state to become a railroad promoter.

Massachusetts has had her try at railroading. To pierce the Berkshire Mountains with a tunnel was thought to be too expensive a task for private capital. The building of the Hoosac Tunnel therefore was undertaken by the state and by it was operated unsuccessfully several years. The property finally passed into the hands of the Boston & Maine Railroad.

W. F. Allen, secretary of the American Railway Association, is responsible for the statement that the Western & Atlantic Railroad, 137 miles in length, was constructed and operated by the state of Georgia and is described as gradually having become "a prolific source of loss and injury to the community that had supplied the funds for its construction." It has been operated under lease since 1870 and is now part of the Nashville, Chattanooga & St. Louis Railroad, though still owned by the state.

Regarding state ownership in Pennsylvania, Mr. Allen said: "Eighty miles of railway, extending from Philadelphia to Columbia, were built by the state of Pennsylvania and operated unremuneratively by its government several years to the disgust of the people of the state. The road finally was sold to the Pennsylvania Railroad in 1857 and forms part of its original main line." The price paid by the Pennsylvania Railroad to the state was \$7,500,000, which is said to have been at least twice what it was worth, yet but about a quarter of what it had cost the state. W. B. Wilson, historian of the Pennsylvania Railroad, says in referring to this line: "The individual transporter who did not dance when the politician in charge of traffic piped was placed at a great disadvantage. It became a potent factor for corruption and reached such an extent that the transporters who would do certain things for the politicians at elections would have their tolls rebated to an extent that nearly always reached a refund of the entire amount paid. The state debt grew and grew till bankruptcy stared the people in the face." This railroad experiment is said to have cost the state of Pennsylvania upward of twenty million dollars.

There are other instances where state and municipal bodies have taken up building and operating railroads, as in Cincinnati, where the city built and now owns (but has ceased to operate) the Cin-

cinnati Southern Railroad, 338 miles in length; also, as in Texas, where a little railway, 32 miles long, was built and is to this day being operated by the state. This last example is the only case in our entire land where the state at present operates a railroad.

It is not believed that the experiences here cited can be construed into an argument in favor of public ownership and operation of all or any portion of our railroad system.

It is proper to state, however, that under the conditions then existing it is probable none of these lines would or could have been built without the assistance of the credit of the state, and it must be remembered, too, that in those early stages of railroad development it had yet to be learned whether public or private management was best adapted to the needs.

In considering government ownership, it is proper that the Panama Railroad, 47 miles long, now owned and operated by the federal government, should be mentioned. About ten years ago the United States acquired this railroad and the steamship company as well, this being necessary to facilitate the construction of the canal. On the average it costs the railroads of this country about \$7,700 per mile for operating expenses. At Panama, leaving the steamship company out of the calculation, it costs rather more than \$50,000 per mile. In order therefore to avoid showing a deficit from operation, a freight rate of almost seven times the United States average is charged and collected. Some idea of what might happen under a general nationalization of the railroads may be formed from the Panama experience. The steamship company, taken by itself, shows a deficit from operation, though when its figures are merged with those of the railroad a goodly surplus appears.

Before taking up a discussion of government owned railroads in other continents it will be instructive to examine into the affairs of Canada's most conspicuous example. Of the 22,994 miles of Canadian railways in operation in 1910, 1,717 were government owned and operated, by far the larger part of this being the Inter-colonial Railway. This property occupies some of the best territory in Canada, and, while the Canadian Pacific, the Grand Trunk and the Canadian Northern, all privately operated roads, have been giving good accounts of themselves, this property has been going steadily to the bad. It seldom pays its bare operating costs, the deficit being met by general tax. If this property had a funded debt with interest to meet, it would have been bankrupt long ago. W.

R. Givens, in *Moody's Magazine*, says that the trouble is "because it lives, moves and has its being as a political institution. It was not born on economic grounds, but for military and political necessities, and the fiction is that it was never intended to pay but to be run for the good of Canada." Each political party when out of office charges that its poor results are due to the use of the railway for the political purposes of the party in office. The charge seems to be true. At any rate the deplorable results of government operation of the Intercolonial are too well known to require further comment. This line, being of considerable length, about 1,400 miles, and operating under physical conditions so closely analogous to those existing in the United States, would seem to furnish all the object lesson necessary under the circumstances.

Of the European countries, France exhibits the most striking example of the failure, and Germany of the success of, government ownership and operation. In France the failure is so marked that it amounts practically to a scandal.

Of the 30,668 miles of railway in France, only 5,509 miles are government owned and operated, most of this being the Western Railway of France, that serves the important western and northern provinces and seaports and connects them with Paris. This line was taken over from the private company in 1908. The gross receipts from that time on have shown an increase, but the operating expenses and accumulated deficit from operation have also increased at an alarming pace. We are speaking now of conditions existent previous to the outbreak of the world war. Net earnings seem to be on the toboggan slide, as will be seen from the following table by Virgil T. Leak:

(In millions of francs)

	Gross Earnings	Net Earnings	Deficit
1908.....	219.6	71.6	27.1
1909.....	219.3	70.0	38.7
1910.....	229.6	57.2	58.4
1911.....	236.1	30.2	71.3
1912.....	244.3	21.9	84.4
1913.....	251.8	26.1	89.9

During this period, while the deficit from operation was piling up, a most deplorable condition existed in the physical operation of the property. Fewer and slower passenger trains, irregular service, lack of fidelity to schedule, scarcity of freight cars, impaired roadbed and other like ailments have affected the property and exasperated its patrons. In commenting on the situation Paul Leroy-

Beaulieu, an eminent French economist, said in 1912: "Everyone knows the deplorable result of the management of the company of the West by the state. . . . In short, at the end of three years, government ownership appears to be a public calamity and a financial disaster. Moreover, substantial accidents occur, one after another, not only on the Western Railway, but on the old system that the government has been administering nearly thirty-five years."

Under the terms of the charters granted by France to the private companies operating the twenty-five thousand miles of other lines, the nation can step in at certain times and buy the properties for certain prices to be arrived at along well defined lines. The total net deficit from government operation of the Western Railway (1908-1913, inclusive) has been upward of seventy million dollars. Unless this road shows a marked improvement during the years to come it is doubtful if advantage will be taken of this opportunity to extend. One experiment of this kind will probably suffice for France.

Turning from the disastrous experiences of France, quite another story is found in the history of the state operated roads of Germany. Of the 37,973 miles of German railways, 34,604, or 91.1 per cent, are government owned and operated, and with success. It is to Germany that advocates of government ownership always turn for their arguments, and indeed many are here to be found. The Prussian state railways, that dominate the German system, pay 8 per cent on the actual cash invested in them. This is double the amount of return paid by the railroads of the United States on their capitalization; and the per mile capitalization of the Prussian railways is twice as great as ours. There is, however, nothing in the experience of Germany to give encouragement to shippers who advocate government ownership on the theory that the adoption of this policy would tend to a reduction in freight rates. The average ton-mile rate in the United States is about 7.5 mills, while the German average is about 14 mills. In other words, German freight rates are nearly double ours. The total gross freight earnings of all United States railroads was, in 1910, \$1,925,553,036. If German rates had prevailed here it would have cost the people to transport the same amount of freight \$3,594,365,667 (or an excess of \$1,668,812,631), which sum is more than two and a half times the gross passenger revenue of all the railroads in this country. It is also fair to say that the wages paid railroadmen on the average in Germany are but one-half those paid in the United States.

Prof. W. J. Cunningham gave an interesting lecture before the New York Railroad Club in April, 1913, on the Prussian state railroads. His concluding remarks were:

The writer's conclusion is that it is futile to attempt any exact comparison, either of freight rates, passenger rates, expenses or net returns, in terms of percentages or of ratios, of one country to that of another. Where social and economic conditions are so essentially dissimilar it is impossible to find a measuring stick that will permit us to gage the relative reasonableness of rates or of relative efficiency of operation. The real question is, "How well does the transportation system of each country measure up to the requirements of that country?" The answer must necessarily be based on opinion rather than on fact. Concerning Prussia, it seems that state ownership is successful and that the railways are operated with reasonable efficiency. If it is granted that Prussia has met with substantial success in owning and operating its railways it does not follow that government ownership in this country would be equally successful. Nowhere are conditions for government ownership more ideal than in Prussia. It has a strong centralized government. The administrative head of the railways is appointed by and is responsible to the kaiser only. Changes in the office are infrequent. Civil service applies to high officials and workmen alike. Military discipline obtains throughout the entire army of employes. It permeates the whole social organization of the country. Apparently there is no graft and no political patronage. Can you say as much for this country? Is the public service elevated to such a plane that we can safely trust it with the great enlargement of power that would come with government ownership of railways? Are we sure the equality and efficiency of the service would not be lowered rather than improved?

Austria-Hungary operates 27,554 miles of railway, of which 22,034, or 80 per cent, are state owned. Here the government has to go down into its pocket each year and produce about twenty-five million dollars to make good the deficit from operation. The president of the Austrian Chamber of Deputies, M. Pattai, himself a friend of government ownership, said in 1910:

We still are in favor of the principle, but it does not seem to us that our government has performed a remarkable feat when it has succeeded in creating a deficit on the Northern Railway. The government has enlisted an army of new employes. They have gone much too far in the reduction of the hours of labor. Instead of a commercial management they have appointed lawyers to posts that require business men and experts. They have established an entirely impracticable bureaucracy.

In Switzerland, where the state owns and operates 1,700 out of a total of 2,920 miles, or 58.3 per cent, the results, since acquisition by the state, have been distinctly good. Rates have been reduced, wages raised and the state owned lines show a profit from operation. Most of the Swiss lines were taken over in 1902, though the

St. Gothard line was not taken over till 1909. It is said that the state paid 35 per cent more for them than was estimated, but that the public was consoled by the promise of a reduction in the number of employes and in operating expenses as well. What actually took place, however, was, according to John S. Hodgson, an increase in the number of operatives by nearly 20 per cent. The estimated saving of \$120,000 a year in operating expenses amounted in reality to an increase over the figures of previous managements of \$340,000 a year.

Italy has 10,483 miles of railway, 8,825 or 84.6 per cent of which belong to the nation. The railways of Italy, both private and public owned, are so badly operated and make such poor financial returns that but indifferent arguments can be deduced from their operations, either pro or con.

In Belgium, with its 2,684 miles of state owned and its 2,600 miles of privately owned lines, the operating ratio of the former was 65 per cent, while that of the latter was 45 per cent. Allowing for interest on the investment, the deficit of the state owned lines, it is estimated by E. A. Pratt, would amount to \$14,000,000 yearly.

Great Britain's position is today similar to that of the United States. All of her 23,387 miles of railway are company owned and for some years there has been more or less agitation in favor of the government taking over the entire system. Great Britain's railway mileage is less than a tenth of ours and therefore the problem does not present such a serious aspect. Nevertheless her experience with the nationalization of telegraph and telephone lines is such that we believe it will be long before England adopts a similar policy regarding her railways.

Next to Germany, the advocates of Railway nationalization hold up Australia and New Zealand as examples. In these countries there is a total mileage of 19,262, of which 18,027 or 93.6 per cent is state owned and operated. A. A. Brown, in an article contributed to *Arena* in 1907, says that the New Zealand state owned railways are a shining example of all that is efficient. Yet Prof. James E. Le Rossignol in *Moody's Magazine* of the same year says that, after paying interest on the investment, the state lines were operated at a loss of over \$850,000 a year.

In Australia the railways were operated for many years on a purely political basis. In consequence the service was poor and earnings unsatisfactory. Since the general strike in Victoria in 1903 in which the government won, conditions have been improved

somewhat. Railway management is now in the hands of a permanent so-called non-partisan board of commissioners. That there still is room for improvement is evidenced by the fact that the determination of the location of new lines and of betterments is based more on political considerations than on economic grounds.

Unlike the United States, where it has been the policy to open up new territories by building lines into them in advance, Australia waits for development to take place before extending railway service. This continent has enormous undeveloped areas, and in consequence development has been slow. Notwithstanding this policy these railways, in 1911, the most prosperous in their history, made a net return to the state after the payment of interest—in other words, a net return of moneys that could actually be used for the public benefit—of but \$446 per mile, which is substantially the sum paid by the United States railroads in that year in taxes alone. Great trouble and delay is caused to shippers by a perpetual shortage of freight cars as well as in the character of the freight equipment. Australian railway experience is often referred to as an argument in favor of government ownership. There must be some ground for a difference of opinion. I quote from E. A. Pratt who has made a study of the Australian railway situation:

If a private company were the owner of the railways and conducted them in a similar manner to that of the state, the producers and people generally would rise in revolt. No business company with any claims to business acumen would run a large sized carrying concern like the railway system of this state in a manner such as prevails in New South Wales.

Having briefly discussed the railway situation in the more prominent countries where government ownership occurs, the writer here submits E. A. Pratt's tabulation showing the world's mileage of railways, both publicly and privately owned, as of 1910 (in miles):

	Miles owned by		Total	Percentage of	
	State	Companies		State	Company
Europe	107,663	99,632	207,295	51.9	48.1
America	12,190	314,693	326,883	3.7	96.3
Asia	36,710	26,581	63,291	58.0	42.0
Africa	11,478	11,412	22,890	50.1	49.9
Australasia	18,027	1,235	19,062	93.6	6.4
World's total.....	186,068	453,553	639,621	29.1	70.9

From this compilation it will be seen that only 29.1 per cent of the world's railway mileage is state owned. This percentage is greatly influenced by the large proportion of United States privately

owned railways (241,056 miles at the time these tables were compiled). Eliminating this figure from the world's mileage, the count would be :

World's privately owned mileage.....	212,497
World's state owned mileage.....	188,258

In other words, still a large preponderance in favor of privately owned lines would be shown—a preponderance nearly equal to Great Britain's entire mileage.

It is now interesting to ascertain if there is any basic underlying reason that has been the cause of nationalizing these 188,258 miles of railways, and to see to what degree these reasons affect our own case.

It is evident why, in the early stages of railroading, the different states in this country tried their hands at railroad building and operation. Such large enterprises were deemed at that time too big to be handled by any less important institution than the state. No private corporation or group was thought to be financially strong enough to cope with such enormous enterprises. It was an untried field. The states tried it and are now out of it altogether, many with burnt fingers. It was found impossible to keep these affairs out of politics. With the inefficient and incompetent management resulting from political patronage, the record has been the dismal failure already alluded to. In view of the experience with the comparatively small mileage with which this experiment was tried, can it be hoped that different results may be reached with the mileage of today?

In Prussia, that most conspicuous example of the beneficial effects of nationalization, the underlying reasons for entering this field were political aggrandizement and militarism. Prince Bismarck planned the movement, based on military lines, and the entire railway system of Germany is one vast military organization, operated first for the benefit of the state and second for the convenience of patrons. It cannot be denied that success has been attained in both directions. When it comes to a comparison of railroad conditions in Germany with those in the United States, it is difficult to find any really valid argument why we should follow its example. Germany is a military state, always armed to the teeth, fearing international complications. This is due to its geographical position. If the United States were no bigger than the state of New York, and if New England on the one side and Pennsylvania and Ohio on the other were separate and distinct nations, speaking different languages and with different traditions, it is possible that we, too, might become

a military nation and that it might be expedient for us to build and operate our railroads on military lines and in the interest first of the state.

Practically the same reasons as those applying to Germany may be cited as the cause why Austria-Hungary nationalized so large a proportion of its railway mileage. The step was necessary in order to maintain the autocratic power of the government.

Belgium and Switzerland took over their railway lines because of fear of domination by foreign capital. The same reason has been attributed to Japan's action in nationalizing her 4,539 miles (out of 6,090) of railway lines. Italy was compelled in a measure to take over the ownership of its railways in consequence of original subsidies and to solve the otherwise inextricable complications about rates and regulation. In its attempted solution Italy has not scored a distinct success.

In New Zealand and Australia, those commonwealths built their own railways because the capital could not be secured excepting on the credit of the state.

It thus will be seen that no well grounded principle, applicable to conditions existing in the United States, can be deduced as a result of the experience of other nations. Certainly we do not fear the domination of foreign capital. This country is too big and too prosperous to be frightened by such a thought. On the other hand, our railroads have persistently sought foreign capital, and will be seeking more. With proper and just regulation; with a settled policy regarding rates that the carrier may charge for services rendered that will be fair both to carrier and to consignee; with some of the inconsistencies growing out of too much regulation or the existence of too many regulating bodies each with conflicting views removed, and regulations centralized into one body composed of practical business men and experts, not theorists and politicians—men committed to constructive rather than destructive policies; with laws enacted and enforced that will put an end to the pernicious practices that have been indulged in by some of the railroads in the past—in other words, when we have given our house a thorough cleaning—capital for these privately owned lines will again flow freely into the railroad reservoir, both from this country and from abroad.

TEN GREAT ARMIES OF AMERICAN RAILWAY LABOR

FROM THE NEW YORK TIMES ANNALIST, MAY 18, 1914.

There are ten principal divisions of the army of organized labor that forms the human part of the vast and intricate machinery of transportation. They are like ten states bound together by no other tie than a community of interest—a loosely knit republic of labor. Their growth has more than kept pace with that of the powers they serve. Each order, brotherhood, or union began in a very small way—with a mere handful of unsatisfied men. Each has suffered many vicissitudes, and each has risen to its present power by relatively similar methods. A favorite one has been the employment of paid organizers.

About half of all the employes of the railroads belong to one or another of these associations connected with the service. When action seems to them to be necessary, all the members of one or more orders, or brotherhoods, or unions, combine as a unit to enforce their demands. It is this which has made them a force to be reckoned with, even to the passing of special laws by the Congress of the United States.

HUGE MEMBERSHIP.

The membership of these ten great railroad powers fluctuates. Of late years it has been increasing steadily. Stated in round numbers, it aggregates about 700,000, made up as follows:

Brotherhood of Locomotive Engineers	75,000
Brotherhood of Railroad Trainmen	130,000
Order of Railway Conductors.....	55,000
Brotherhood of Locomotive Firemen and Enginemen.....	75,000
Brotherhood of Railway Clerks	55,000
Brotherhood of Maintenance of Way Employes.....	50,000
International Association of Machinists.....	80,000
Order of Railway Telegraphers.....	45,000
Switchmen's Union	90,000
Brotherhood of Railway Carmen.....	45,000
 *Total	 700,000

There are about 1,900,000 railroad employes in the United States. Among them are some 300,000 common laborers, and nearly an

* These figures include railway employes in Canada and Mexico.

equal number of men who are divided among a score or so of relatively small organizations, or who belong to none at all.

All but four of the great railway organizations are affiliated with the American Federation of Labor. These four are the Brotherhoods of Locomotive Engineers, Locomotive Firemen and Engineers, and Railroad Trainmen, and the Order of Railway Conductors, aggregating 335,000. These bodies are made up of highly skilled men. None of these have regularly employed organizers to increase its membership. In fact, they remind one somewhat of the ancient guilds of craftsmen in the qualifications they exact on the part of those who would join them. By some they are called the aristocrats of the railroad labor world. Their leaders are men of unusual force and executive ability.

THE BROTHERHOOD OF LOCOMOTIVE ENGINEERS.

The Brotherhood of Locomotive Engineers is the oldest, and its career has been one of almost unbroken prosperity. Its principles, as set forth in its constitution, are:

"Do unto others as ye would that they should do unto you, and so fulfill the law—Sobriety, Truth, Justice and Morality—Vigilance, not Violence."

In the fifties the demand for engineers was so great that many inexperienced, incompetent, and intemperate men found places with the railroads. They were a danger to their fellow-employees as well as to the public. A few of the older and more thoughtful engineers sent out a circular asking the men on all railroads to send delegates to a convention of locomotive engineers to be held in Baltimore, Nov. 6, 1855. The name adopted for the organization they formed was the National Protective Association of the United States. Meetings were held annually for a few years, but the shadow of the impending civil war was sweeping over the land, and the mighty questions involved drove almost all others from the public mind. The first effort at organization among the engineers dwindled until there was little left but the name.

In 1863 there was another meeting. It was composed of twelve of the old members and was held at Detroit. The Brotherhood of the Footboard was born. Its constitution and by-laws embodied the fundamental principles of the brotherhood as it exists today. The purposes then announced were for the members to reach a high standard of ability as engineers and of character as men, and to insist by all legitimate means on securing the compensation to which

they felt themselves entitled. At the convention the following year the name of the organization was changed to the Brotherhood of Locomotive Engineers, and two years later a mutual life and accident association was started. The present amount of insurance in force is about \$150,000,000. More than \$30,000,000 has been disbursed in the payment of death and disability claims. Since 1867 the insurance rate never has exceeded $1\frac{1}{2}$ per cent.

The records compiled by the brotherhood show that out of every 100 men who begin as firemen only seventeen ever become engineers, and of these only six ever attain a passenger run.

Ninety per cent of all the locomotive engineers in North America belong to the brotherhood. No member is allowed to join any other labor organization under penalty of expulsion. With the exception of two or three local strikes by some of its constituent branches, this brotherhood never has had a strike, although, more than once, it has given an ultimatum that it was ready to call one if its demands were not complied with.

[At present the Brotherhood boasts 74,000 members. Being international in its scope it has lost about one thousand members in Mexico since the revolution broke out and played havoc with railway transportation in that distracted country.—Ed. Library.]

THE FIREMEN.

More than one-fifth of the coal mined in America is shoveled into the fireboxes of the locomotives each year. The Firemen's Brotherhood was founded in December, 1873, at Port Jervis, N. Y. At first it gained membership rapidly. Then two or three years of general hard times came along, and the brotherhood all but succumbed. Since 1881, however, its prosperity has had only one serious interruption—the strike of the American Railway Union against the Pullman Company, in which a number of the members of the brotherhood were involved. Owing to this it lost 4,000.

In 1880 the Brotherhood of Locomotive Firemen and Enginemen was practically insolvent. It had to "pass the hat" to continue its financial existence. In 1881 its benefit department disbursed \$3,160. Last year it paid out nearly \$1,500,000—a startling contrast.

[According to official information the total membership of the Brotherhood on June 1, 1915, was 83,339, and for the year ending on that date it had disbursed \$979,965 from its beneficiary and benevolent funds in death and disability benefits.

At the close of business May 31, 1915, the funds reported on hand were as follows:

Petty Cash Fund.....	\$ 100.00
Receiving Fund	5,287.02
Beneficiary Fund	2,536,779.31
General Fund	237,394.73
Protective Fund	537,819.40
Benevolent Fund	45,701.64
Beneficiary Expense Fund	11,887.43
Beneficiary Reserve Fund	561,864.63
Beneficiary Building Fund (Cash)	11,876.21
Beneficiary Building Fund (Property).....	183,669.59
Statistical Fund	755.00

Total\$4,133,134.96

[—Ed. Library]

THE CONDUCTORS.

The conductor of a railway train is like the captain of a ship. When the Order of Railway Conductors was organized air brakes and a train order by telegraph were not known. When the whistle called for "down brakes" the conductor and the rest of the crew had to rush to the end of the car and try to stop the train by main strength. The beginning of the conductors' order was a half-dozen men who met at Amboy, Ill., in the Spring of 1868. The railroads objected to their organizing, and the union died almost before it had drawn a long breath. In 1877 it had but 1,056 members. Its rate of increase has varied from phenominal to steady since then. One of the most important accomplishments of the Order of Railway Conductors has been the compelling of the railroads to equip their rolling stock with safety devices. There was much opposition to this at first, but now no railroad would think of returning to the old methods of handling traffic.

THE TRAINMEN'S ORGANIZATION.

The Brotherhood of Railroad Trainmen was organized about eight years before the introduction of the air-brake and automatic coupler. It was largely instrumental in bringing about legislation that made the use of safety devices on railways necessary. The conflict between the railway companies and the men over rates and rules was incessant. The work of the trainmen was extra hazardous and they were without schemes of their own to assist each other in the time of trouble. It was then the common habit to pass the hat which was not at all satisfactory. Tragedies were then a part of the day's work and the night's sorrow and a systematic effort was determined

upon to relieve distress. Out of this desire came the insurance department of the Brotherhood. Numerically it is the greatest of the railway organizations. A few brakemen met in a caboose of the D. & H. Company, Oneonta, N. Y., September 23, 1883, and founded the present Brotherhood. Since it has been organized it has paid out in death and total disability benefits more than thirty-two million dollars. It has exerted a tremendous influence in the making of wage arrangements and the adoption of general rules governing the employment of trainmen. Back in the early 80's the average pay of the trainman and switchman was around \$45 a month. Now it averages \$75 a month for trainmen and \$100 a month for switchmen.

THE TELEGRAPHERS.

With the train dispatchers and ordinary telegraphers, running trains is like a gigantic game of chess. Nearly 50,000 telegraph operators move the pieces in the game. They are matched against one opponent—Time. The contest never ends, but the men at the keys render the time card dependable. Without the incessant vigilance of the operators all would be chaos.

A single telegraph operator founded the Order of Railway Telegraphers, the players in the mighty game, in 1886. The first sixteen years of the order's existence were stormy and discouraging. Today all but 10 per cent of the dispatchers, telegraphers, station agents, interlockers, lever-men and other eligibles in the United States and Canada belong to it. It has paid out nearly \$1,000,000 in death claims, and has nearly \$500,000 in its treasury. The average wage paid to operators is more than double what it was when the order was founded. It has had the usual vicissitudes, and is unique among these organizations in its method of getting new members—by soliciting them by wire.

RAILWAY CLERKS.

It requires more than 300,000 clerks to keep track of the business of American railways. About one-fourth this number are employed in the general offices. The others are widely scattered. At each division or transfer point on the line there are dozens, or scores, or hundreds, according to the volume of the traffic. There is more routine than excitement in the clerk's job. Ten years ago this brotherhood had less than 2,000 members. It was born at Sedalia, Mo., December 29, 1899. At first there was not enough money to pay postage for circulars soliciting new members; they had to pile up until pay day. It did not make its first agreement with an entire railroad system,

covering wages, conditions of work, etc., until 1899. The following year it secured for its members increases in salaries aggregating more than \$1,000,000.

THE ARMY OF TRACKMEN.

About one man in every four among the railway employes is charged with keeping the track in order. One dollar in every six spent by the railroads is for this all-important purpose. The same man who founded the Brotherhood of Railway Telegraphers established the International Brotherhood of Maintenance of Way Employes, at La Porte City, Iowa, in 1886. There was dissension from the first, when there were but a score or so members. Three years after it was founded a staff of paid organizers was established. A rival organization started up. Later the two were merged. By 1891 the troubles of the association disappeared. In that year the office of the brotherhood was in the bedroom of the grand chief. Today they occupy 6,000 square feet of floor space in a St. Louis office building.

THE SWITCHMEN.

Nearly one-third of the work of transporting freight is done in railroad yards by switching engines. Switch engines travel nearly 350,000,000 miles a year, and freight locomotives in road service about 750,000,000 miles. Switching costs the railroads nearly \$150,000,000 a year, more than 8 per cent of the total operating expenses.

The Switchmen's Union was founded a little more than twenty years ago in much the same manner as that of the Maintenance of Way Employes, by a mere handful of men. It has had serious setbacks, due to unsuccessful strikes, in the course of its career, but today it is one of the strongest numerically of the great railway organizations.

THE MACHINISTS.

The International Association of Machinists was formed at Atlanta, Ga., in 1887, by six men who had been summoned to put through a rush repair job on a Sunday. There was no overtime or extra pay in those days. By the time the broken-down locomotive was in shape again the union was born. It now has a thousand lodges in the United States, Canada, Mexico, Porto Rico and Panama.

The great strike of the American Railway Union, which began in June, 1894, nearly ended the machinists' organization. But after it was over the union started out its organizers and gathered new members. The progress of this union has been marked by many

strikes. Since 1891 it has paid out more than \$500,000 in strike benefits to its members. Strike benefits are paid at the rate of \$6 a week for single men and \$8 a week for those who are married.

RAILWAY CARMEN.

The Brotherhood of Railway Carmen takes in about sixty different occupations. The first lodge of the brotherhood was instituted at Cedar Rapids, Iowa, in October, 1888. Two brothers carried it along and kept it alive for more than eleven years. It nearly passed out of existence as a result of the great strike of the American Railway Union, but after that was ended the carmen took a new lease on life and have prospered ever since.

Such, in its briefest form, is the tale of the ten great powers of the railroad labor empire. In a way they are like ten separate political parties. Each wishes to attain the same ends, but has different ideas as to the methods to pursue. Each has its own petty strifes and differences of opinion. Each is a power to be reckoned with.

THE RAILWAYS IN TIME OF WAR*

BY H. G. SMITH, GENERAL SUPERINTENDENT'S OFFICE, MIDLAND RAILWAY, DERBY.

FROM THE RAILWAY NEWS.

For all practical purposes railways have been in existence ninety years, and, strange to say, the present European conflict is the first real test to which they have been put as regards their value in time of war. It would be interesting to speculate how the Duke of Wellington would have fared a century ago in Flanders in his campaign against Napoleon had the railway system been at hand for the transport of his army, or had his opponent been similarly aided, but the most casual student of history appreciates the mighty contrast between the two campaigns—the one a century ago without railways, and the present one with railways. The railway has had to wait ninety years for its real testing time, a long period it would seem to many people, but the reason for this is that during that interval of comparative peace there have been only five wars in which the usefulness of the “iron road” could be demonstrated, namely, the Italian War of 1859, the American Civil War of 1861-1865, the Franco-German War of 1870, the South African War of 1899-1902, and the Russo-Japanese War of 1904-05.

In the first example—the Italian War—the railway system was employed with limited success owing to its primitive development; in the American Civil War the railway was useful for conveying the wounded to the rear, and caused the Army medical authorities to alter many of their methods for dealing with the casualties;† the Franco-German campaign revealed in a striking degree the possibilities which lay ahead in railways as transport factors, and the German commanders made full use of their own railways and the 1,600 miles of captured French lines in addition; whilst the South African and Russo-Japanese Wars were conducted in areas meagrely equipped with railways which were not adapted for bringing off brilliant coups by the combatant armies.

*This essay won the First Prize in a competition instituted by the Midland Railway Literary and Debating Society on the subject indicated in the title.

†A comprehensive history of railway services on both sides of the line in the American Civil War has yet to be written.—S. T.

The European events of July and August last culminating in Germany being embroiled in war with Russia, Belgium, France and England provided a state of affairs in which the railways of the respective countries have played a part almost second to that of actual conflict.

The title of this paper, it is presumed, implies that the subject is to be treated in general terms as affecting other countries as well as Great Britain, and without reference to actual details of arrangements and workings. In order to demonstrate the value of railways in time of war, it will be convenient at this point to set out in broad outline the necessary conditions and factors governing their advantageous utilization, viz.:

(1) Necessity for collective and central control of all railways in any area or country for military and civil purposes in time of war.

(2) Transport of troops, equipment, munitions of war, and wounded.

(3) Utilization of railway works, plant, appliances and resources for purposes other than apply in peace times.

(4) Railways as strategic factors.

On examination these four headings will be found to include practically every phase of the subject under discussion:

(1) In the first place, it is impossible to emphasize too strongly the necessity for collective and central control, especially in a war of such magnitude as the present one. Prince Bismarck realized this after the Franco-German War, and whilst seeing the immense possibilities of earning revenue from the State ownership of Prussian railways, he saw also most clearly the importance of a unified railway system as a means of transport for military purposes.

The Government of France provided forty years ago a permanent military organization which should always have in readiness a scheme whereby in case of war the existing railways could be placed under a central control in order to utilize all means of transportation for the benefit of the State, military needs, of course, taking precedence.

Russia, too, is an example where, although the railways are not owned by the State, the Government exercises a strict control for military purposes in time of war.

In Great Britain, with its privately-owned railway system, the present crisis brought into being for the first time a comprehensive and direct State control, exercised through the Railway Executive Committee, a body composed of railway general managers. This

State control was not an emergency arrangement, but was provided for under section 16 of the Regulation of the Forces Act of 1871.

It is interesting to note that as long ago as 1865 an Engineer and Railway Staff Corps was established to prepare in peace times a scheme for directing the application of skilled labor and railway transport to the purposes of national defense in Great Britain. It was recognized that under the altered condition brought about by the development of steam traction, the network of railways which was gradually spreading over the country would be of great importance in case of invasion. The problem was to secure uniformity of control and to utilize the resources of the railways to the fullest extent for the benefit of the State in any operations made necessary by belligerent conditions. A scheme was formulated, and the railway managers were appointed as responsible officers for its proper working.

Later, a War Railway Council was formed, and this Council the Railway Executive Committee superseded last August in order to exercise on behalf of the Government a direct control over the railways. The control is principally for facilitating the movement of troops and equipment, but the Committee are at the same time to provide for the requirements of the civil community to be reasonably met. As the members of the Committee are practical railway officers with an intimate knowledge of the resources of their respective companies, it follows that the control can be exercised in the best and fullest manner. The terms of employment of the railway staff remain unaltered, and instructions to the men are issued through the usual railway channels.

Eight months' experience of the working of the Railway Executive Committee's control has shown its efficacy. The most exacting military requirements in matters of transport have been met and with little interference to the working of traffic for the business community. Certain passenger and merchandise services have been curtailed, but without causing much dislocation or complaint. In fact, it is surprising how easy it has been to maintain the motto, "Business as usual." The question of compensation to the individual companies for the use of their lines does not, of course, come within the scope of this paper.

(2) In the second place comes the actual transportation of troops, equipment, munitions of war, and wounded men. The successful execution of this depends largely upon the efficacy of the control referred to in the previous chapter. And unless the military

and naval authorities can rely upon an expeditious, definite, and regular transport service their plans for operations in the field and on the seas are nullified. Hence a country possessing a railway system which in its essentials—gauge, rolling stock, and signalling—is standardized, has an ally of the greatest utility. Germany is well provided in this respect, and her preparations include also the lettering of all rolling stock, with particulars of carrying capacity in terms of men, horses, and guns; trains to carry a certain quantity of men and materials can thus easily be made up at any point. The French and Belgian State Railways in their turn have made arrangements for requisitioning at short notice rolling stock of certain types suitable for conveying armies.

Great Britain, with its private ownership of railways, has in many respects a standard which the companies have followed, largely as the result of voluntary conferences at the Railway Clearing House, for instance:

Standardized:

Gauge (4 ft. 8½ in.).

Passenger and goods vehicles designed for working on any company's line.

Provision of special rolling stock for carrying heavy guns.

Height and width of rolling stock (with one or two exceptions).

Brake power on engines and vehicles; either automatic vacuum or Westinghouse, dual-fitted stock being provided for through working.

Signalling, with the exception of branches and single lines.

All British railways have telegraph and telephone services connecting all stations, thus enabling headquarters to get into touch with any point at short notice, and altered methods of signalling and working in emergencies can easily be arranged. So far as the Midland Company is concerned, the "Control" system of working traffic enables special arrangements to be made quickly.

The competitive system under which railways in this country have been managed in the past has resulted in a high state of working efficiency being obtained, with the object naturally of providing a quick and certain transport service for revenue purposes; and with this end in view, engines, stock, permanent way, and other equipment have been kept in good order, more so, perhaps, than under a complete State management. The Order in Council providing for the control of the Railway Executive Committee, there-

fore, put into their hands an instrument of high efficiency and capacity for the military requirements.

For many years past the trunk railways have had in existence a "War Time-table," kept up to date, for the working of troop trains from chosen centers after mobilization of the forces. To some extent also the movement of troops at manœuvres in various parts of the country annually has provided useful experiments in the matter of loading, conveyance, and unloading of large bodies of men with their equipment. In August last, therefore, the "War Time-table" came into operation with the ease of clockwork, and it is common knowledge how smoothly and quickly the Expeditionary Force was transported to the South Coast. Fourteen days after the declaration of war the official Press Bureau issued the following notice:

"The Expeditionary Force, as detailed for foreign service, has been safely landed on French soil. The embarkation, transportation, and disembarkation of men and stores were alike carried through with the greatest possible precision and without a single casualty."

Lord Kitchener stated in the House of Lords that:

"The railway companies in the all-important matter of the transport facilities have more than justified the complete confidence reposed in them by the War Office."

This is sufficient proof of one phase of the value of railways in time of war.

In a similarly rapid manner the German, French and Russian armies were conveyed to their destinations. Actual fighting consequently took place in an incredibly short time after the declaration of hostilities, and (but for circumstances which need not be entered into here) the Germans would have scored an undoubted success—probably victory in the western area—thanks to the efficiency of their rail transport services.

Then, again, an efficient railway system is of great value for drawing the wounded from the fighting lines and thus leaving the combatant forces free in their movements and plans. Specially-designed and equipped ambulance trains are now a recognized feature in this country and on the Continent; and apart from other considerations are valuable aids to the quick recovery of wounded men; the latter can be distributed quickly to hospitals all over the country instead of overcrowding the base hospitals, and when convalescent the men can easily reach their homes for recuperation. This knowledge that quick treatment can be obtained no doubt improves the morale of the men.

In Russia it has been found possible to equip trains with baths for the men to use after a spell in the trenches, an innovation which improves the health of the troops.

(3) Further advantages accrue from the utilization of railway locomotive and carriage works for the manufacture of articles required by the military authorities. The large staffs of engineers, artisans, and trained men of various trades in railway "shops" were available for the making of military road vehicles, guns, munitions, electrical machinery, motors, telephones, pumps, stretchers, and equipment of every description.

Cross-channel steamers belonging to railway companies were of use in the transport work, and the docks provided by railway companies for their own requirements in normal times have been of great advantage for military purposes.

Railway hotels at different points being conveniently situated for the treatment of wounded have been turned into military hospitals, because their proximity to stations ensures a minimum of handling from train to bed.

Then, again, the cartage equipment of the railway companies was at hand for use by the military, and motor vans, lorries, horses, barrows, etc., were speedily requisitioned on the outbreak of war.

The subsidiary services of railways are, therefore, of value in time of war.

(4) The last factor is that of railways for strategic purposes. In this country there is not probably a purely strategic railway, due no doubt to the system of privately-owned lines on a competitive working basis. The trunk lines running north and south present opportunities for alternative routes in case one or more were temporarily rendered unworkable; but it may be said that strategical reasons were not considered when they were constructed.

The Continent does, however, present examples of railways built with consideration for military purposes. Russia, for instance, adopted the unusual plan of having a gauge different from that of neighboring European countries, in order to secure greater immunity from attack; this necessitates a change of trains at the frontier, with obvious advantages from a military point of view, though there is a disadvantage in this when the Russian army crosses the frontier and has to transport its material on foreign soil.

Germany, in turn, has dealt with its railways in a scientific way for military reasons. There may not be many lines built for purely military purposes; more often certain main lines have been doubled,

tripled, and even quadrupled to selected points on the frontier, thus making the railway capable of dealing with an amount of traffic hardly ever likely to be carried in normal times. In combination with these multiple tracks large sidings were laid down at convenient places for military mobilization needs. The benefit of these so-called "strategic" railways has been proved by the way in which the German commanders have been able alternately to increase the violence of the offensive on the western and eastern fronts.

In France and Belgium are a number of semi-strategic lines which enable troops to be readily transferred from one main system to another.

Of course, the destruction of certain sections of railway in a district where armies are operating may have a vital strategic utility, but unless care is taken this destruction by the advancing party may recoil with disastrous effect in case a retreat is afterwards necessary. Undoubtedly, railways can be included as strategic factors in military tactics with advantage.

In conclusion, it may be stated that the railways have had a supreme test from which they have emerged triumphantly, and their value in time of war has been abundantly proved.

FRENCH RAILWAYS IN WAR

FROM THE RAILWAY GAZETTE.

A certain amount of information regarding the part played by the British and the German railways in mobilization has already been made public, but so far we have heard little of the work of the French railways. A most interesting article on the subject appears in the *Journal des Transports*, whose re-appearance after temporary suspension due to the war we are glad to chronicle. This article recalls how official opinion in France originally scouted the idea that railways would be worth much from the military standpoint. Even so distinguished a scientist as Arago held that if soldiers were to be transported by rail the infantry "would lose a useful form of training and would soon be unable to march." The modern attitude is best summed up in General Joffre's phrase: "This war is, above all, a railway war."

Throughout the whole country, observes our contemporary, there can be only one opinion as to the masterly fashion in which the French railways have acquitted themselves since the beginning of the war. "Everyone has been able to recognize and to appreciate the marvelous results; everyone knows that as the result of treasures of intelligence, of activity and devotion offered up freely and ungrudgingly, throughout all ranks, the mobilization and concentration of troops were carried out with a success, a precision which the most optimistic did not dare to anticipate; there was not a delay, not an accident." The history of the work accomplished by the French railways may not be written yet, but some general details of the organization will interest the reader.

Article 54 of the *Cahier des Charges* (literally, specifications) under which the French railways operate, provides that if and when the government requires to transport troops and naval and military stores, etc., to any place served by a railway, the companies are under the obligation of immediately placing all their means of transportation at the service of the State. This obligation has existed for over 40 years, and during times of peace a permanent military organization had been created, whose duties were to prepare the railways to accomplish their task in time of war.

Each of the big railway companies has attached to it a committee, the *commission de réseau*, composed of a technical member,

who is in practice the general manager of the line concerned, and a military member. The latter is a high officer of the General Staff, nominated by the Minister of War. The duties of this committee, whose sphere also embraces the secondary (i. e., local) lines within the territory occupied by the system, are to investigate in all its bearings, and with a view to strategic requirements, the manner in which the existing tracks and working stock, together with such special details of equipment as military platforms, halting places for meals, etc., can be utilized in conformity with the needs of the War Office.

Besides these individual commissions de réseau, there is a Superior Military Railways Committee. This body, which was called into being by a ministerial decree of 1898, is presided over by the Chief of the General Staff, and is composed of six generals or other officers of high rank, three representatives of the Ministry of Public Works and the members of the above-described commissions de réseau. Its functions are advisory; it records its opinions concerning any measures proposed by the commissions de réseau, as well as on all questions relative to military transport.

On the declaration of war, there are special regulations affecting railway employes. These provide, incidentally, that if a railway man of military age is called to the Colors, he is mobilized as a railwayman and on a territorial system whereby men employed by the same company are grouped together into regimental units. All these arrangements are worked out in time of peace, and a foretaste of the working of the scheme was provided during the railway strike of 1910, when the men were called out under martial military law, and for the time being became in effect soldiers whose duties were confined to railway work.

On the first day of mobilization, after having been duly notified by the Minister of War, the railways must place at the disposition of the military authorities every available means of transport on certain prescribed sections of line, or throughout the whole system, as the case may be. The railway system of the country is then divided into two "zones," under different authorities. Both are under military control. The "interior zone" comes under the Ministry of War; the Minister and the General Staff regulating conditions of traffic. Under the authority of the Minister, the commission de réseau of each line handles executive functions and each of the two members retains his individual responsibilities, one being entrusted with military measures, while the technical member sees to it that all requirements for the provision of rolling-stock and other matters

connected with actual traffic handling are met. They are aided by sub-committees, each of which is also composed of a military and a technical member.

The "army zone" is under the control of the Commander-in-Chief of the armies in the field, assisted by an officer whose status is that of manager of the army railways. This zone is naturally subdivided, a distinction being made between sections of line without and within the actual scene of military operations. The lines within the former zone are staffed by the employes of the company concerned, organized under the territorial scheme referred to above. Within the zone of actual field operations the service is carried on by military units corresponding more or less with our Royal Engineers.

Precedence is naturally given to military requirements, but provision must, of course, be made for the transportation of foodstuffs and general commercial merchandise. Within the "army zone" ordinary traffic is suspended altogether, save for such exceptions as may be authorized by the Commander-in-Chief. In the "interior zone," such traffic is conducted exclusively according to the conditions prescribed by the Ministry of War, which is empowered, after mobilization and concentration are completed, and on the request of the commissions de réseau, to authorize the partial or complete resumption of ordinary passenger and freight traffic. Throughout the duration of war, the railways must, in the first place, ensure the conveyance of all military traffic under the best possible conditions.

Certain essential characteristics of the mechanism described above call for comment. In the first place, nothing is left to chance. Not only is the entire organization as used in time of war regulated down to the most minute detail in time of peace, but it can be said that the system is actually in force to a certain extent, at normal periods, since the commissions de réseau are constantly working so as to be able to carry out all its obligations on "the day." Another essential characteristic is the very happy association of the military and the technical experts. In time of war, the railways are absolutely under military control, but the executive side is handled by military men and railwaymen in collaboration.

One fact may be remarked in conclusion. The French railway companies, thinking it incumbent on them to do everything possible to swell the number of men with the Colors, have been and are working their lines with the smallest staff necessary to "carry on." Hence, on many sections of line, the normal staff has been reduced by 15 to 20 per cent. The fact is worth mention, for it accentuates the admirable work that is being done by all grades of the men now working the railways of our ally.

FRANCE SAVED BY HER RAILROAD MEN

BY WALTER S. HIATT.*

One of the big achievements of the war in Europe has been the handling of the transportation situation by the railroads. One general has called it "a war of railroads" because of the vast role played by them in getting troops, provisions and munitions to the front and on time, the victory being with the army that gets first to a critical point. The often quoted remark of Napoleon, "an army is as strong as its feet," has been adapted to read: "An army is as strong as its railroads."

Every railroad man today knows that Germany has been able to keep up a remarkable fight on her two frontiers by her government owned military railroad system which enables her to shunt the same troops back and forth from one frontier to the other. It is not known that the French railroads have rendered an equally great service in France and at the same time, with the exception of the first two weeks of the war, practically continued on their regular schedule for civil passengers and commercial freight. And all this wonderful work has been done without any noteworthy accident, and it has been done with a constant rerouting of large numbers of troops and war material to meet new battle conditions on a front 940 kilometers (584 miles) long, from the English channel to the Swiss frontier. It has been done with a decrease of rolling stock, in the face of an ever-decreasing coal supply, and always with the same or a smaller number of railroad men.

During the critical period from August 1 to 20 last, no less than 1,800,000 soldiers were gotten to the front, and each of these soldiers was handled three times, so that in reality 5,400,000 troops were delivered at the required points. While these troops were being moved, while possibly 5,000,000 of the civil population was also traveling, while two armies were being hurried into Alsace and Lorraine to begin a double campaign to turn the German army heading for Belgium, on August 3 a special train was provided to conduct the German ambassador, M. de Schoen, to Berlin. No, there was no panic among the railroad employes, there was no breakdown of the French railroad system.

*Special European correspondent of the *Railway Age Gazette*.

When I got off a ship at Bordeaux lately, the service of which ship, as of all other ships and of all steamship companies, had been seriously interfered with because of the war on land, I expected all sorts of difficulties in riding to Paris, such as slow and dirty trains, frequent side-tracking to permit troop or hospital trains to pass. Right at the very dock, however, I found a railroad agent, as at any American port, ready to sell me a ticket, to assure me that the trains were making fast time, and to check my baggage, both my trunks and that part which I sent by the slow and cheaper method known as "*la petite vitesse*." At the station I noted a great many soldiers, a huge number of hospital automobiles for the wounded, and a large number of civilian travelers. The usual ticket-taker stood at the platform entrance, with a brassard on his arm to indicate that he was under military service. Beside him stood two red-trousered soldiers with their guns bayoneted to check the coming and going of all travelers, both civil and military. The man who carried my baggage wore the sleeve brassard. He, too, was in the military service.

I was surprised that I could take my choice during the day of no less than four fast trains to Paris, any one of which would make the run in the usual eight to nine hours. Yet when I entered my train, before it pulled out, I counted no less than three long hospital trains pulling in, within the space of a couple of minutes each, and each filled with wounded troops, the men sitting or lying, according to the nature of their wounds. Had I been a blind man, the only sign of the war would have been the wet cushion which I happened to sit on. It was stained red with blood from some wound that had broken. Doubtless the car in which I was to ride had but lately come in with some of the wounded and had been made up into the fast passenger train after a hasty cleaning.

I was surprised at what I saw because I had just finished reading a new book telling how the railroad system of France had broken down, and right from the beginning of the war. So well posted a man as C. W. Barron, of Boston, who wrote this book on the financial aspects of the war, stated that last August the railroad men of France were actually taken from their regular posts of duty and mobilized by regiments, and that but for the motor-busses of the Paris street passenger service carrying troops to meet the Germans, Paris would have been taken. While Mr. Barron's book is otherwise full of good information, in this respect it is incorrect. The state-

ment is in line with many made by persons possessed with the bogy of German efficiency.

Already in France the extraordinary service rendered by the railroads is acknowledged, and in time, I am informed, certain of them—privately owned—will be decorated with the Legion of Honor cross. In France there are six large railroad systems, two controlled by the state, and four by private companies, the latter comprising 30,000 of the 36,000 miles of single track; on these latter has fallen the brunt of war transportation, because of their geographical positions. It is true that these railroads were not fully prepared for war on such a scale—nobody on earth was fully prepared for that matter—and it is to their credit that they have met bravely and efficiently these unusual conditions just as do our own railroad men in time of flood or wreck.

It is not denied that the motor car and the motor-bus have and still are rendering a large service. However, it borders on the ridiculous to imagine for a moment that the tremendous transportation work of a railroad has been or can be done by such means. When the truth is told about the way the French troops were launched against the Germans, that resulted in the battle of the Marne, it will be found that it was not so much the few thousands of men hauled in the motor-busses out of Paris but the men of the army of General Manoury that routed the Germans. This army was hastily concentrated at Reims, thanks to the railroads, and so rapidly collected that the German spy and information system did not know of its existence.

I am not judging railroad efficiency of the early part of the war by what I saw in my travels through France lately or of what I saw at the big Paris terminals, where the trains are now moving as quietly and smoothly as in peace times. Not only old railroad men but disinterested travelers during that mobilization period of early August tell me the work was inspiring. Consider the conditions. Every day, beginning with July 26, when the war cloud began to blacken, tourists began to rush to and fro, some to seaports, some inland to their homes, and each day their panic grew. During this first week the trains were doubled, then tripled. No less than 500,000 extra passengers came to or passed through Paris, the railway center of France, and no less than 200,000 of the foreign population left Paris. On July 31 the older soldiers of the reserve army, then as now assigned to the guarding of roads and railroads, began to

arrive at railroad depots and add to the crowds. The next day at 5 o'clock all the railroads, which had so far done their work as civil instruments, came under military law.

Did the railroad men lose their heads when this mobilization was declared? When hundreds of thousands of troops began to move from every city and town and farm of France to their appointed place to join their regiments, when other hundreds of thousands of civilians began to fly hither and thither, the railroad men quietly put on their brassards and continued at work.

An old lady who was at that hour struggling on the crowded Paris platform of the Paris-Lyons-Mediterranean, waiting to get a train for Toulon in the far south, and there say goodbye to her son joining his regiment, lately told me she saw the railroad men moving huge trucks of rifles along the platform, going about their business through that excited crowd in the matter-of-fact way of railroad men in emergency the world over. Yet these men had perhaps been without sleep for several nights. It is true that it took this lady sixty hours to reach Toulon instead of the usual sixteen, but she got there. The wonder is that any civilian trains were permitted. As it was they were only side-tracked while the military trains passed, moving at an average rate of forty miles an hour.

One of the amazing feats of the railroad men was the changing, over-night, of the time tables on every one of the six systems. These time tables were changed to a new schedule accommodating from 140 to 160 trains a day. Every station master was notified by telegraph when trains were due at his station. No less than 200,000 messages of this import were sent in a single day.

During twenty long, hot, murderous days, ten thousand trains were kept in motion throughout France. Happily, not all of these trains moved towards the frontier at the same time. Yet, to the complexity of the general forward movement was added that of first carrying the men to their regimental depot. Neither a regiment nor a division is moved all in a piece, like an excursion party. A soldier living in Paris may have to go first to some relatively distant station in the country where he joins his regiment, is armed and equipped, and then moved with his regiment to the headquarters of its army corps in another place; and finally the army corps is moved to a point on a main line and thence to some place at the front, either in the north or the east. A man working in Reims may have to join his regiment at Toulouse in the south, thence to a military camp, and finally to Verdun in the east. What these 10,000 trains

began to do in August they have been doing ever since, for the other millions of newly recruited men, or for the shifting of armies to new battle regions.

One must have seen the handling of an army corps to get an idea of what these inoffensive-looking French trains have accomplished and still are accomplishing. Let railroad officers who have sweated over a 100-car circus movement consider that any heavy movement of troops is made by army corps, and that an army corps consists of no less than 39,000 men, all told; and that to boot there are cannon, horses, kitchen equipment, engineers' equipment, wagons, aeroplanes, ammunition boxes, provisions—enough things to make the moving of a train-load of wild animals seem tame in comparison.

It takes two trains of fifty cars each to transport the men of an infantry regiment. This regiment is subdivided into three battalions of 1,000 men each, and each battalion into four companies. The military end of the affair is easy. Get your cars there and the soldiers, company by company, hop in quickly, without any confusion. Your cars for the infantry regiments are easily gotten rid of. But you need an extra hundred cars to carry nothing but the immediate infantry equipment—mitrailleuse guns, regiment wagons and odds and ends of baggage.

Then you need another extra twenty trains for the artillery of this army corps. Only one cannon can be set on a flat-car, including its limber. About fifty cars are necessary for each regiment's cannon. Next there must be cars for the horses that drag the cannon, cars for the artillerymen, and for all the other equipment that goes with cannon.

If the cavalry regiments travel with the army corps, the job is still worse, as no less than 6 trains of cars are necessary for one cavalry regiment. Add to these trains the ones required by the commissary, the hospitals, the heavy artillery, the trench diggers, the bridge builders, and no less than 70 trains of fifty cars, or about fifty big circuses, are necessary to move an army corps. And the French railroads, if you please, had to move no less than 42 army corps in twenty days.

PRUSSIAN STATE RAILWAY MANAGEMENT*

FROM THE SPRINGFIELD REPUBLICAN.

Germany's state railroad system is an oppressive monopoly and a political mistake. Recently this view was expressed at three different industrial congresses, and in one case the indictment was backed by a two-thirds majority. This revolt against railroad nationalization comes just at the time when some Americans and Englishmen have begun to see in nationalization an easy, infallible way out of all railroad troubles. What aggravates the indictment is that it is mainly directed against the Prussian state system, which, of all railroad systems in Germany, is the most flourishing and efficient.

Every charge that is customarily leveled against corporation railroad ownership is now being leveled against the Prussian state system. The main charge is that the Prussian system makes for monopoly and restraint of trade. In committing—say critics—all the offenses which private corporations commit, the state knows no fear, for against it the public is doubly helpless, and there are no competing roads which can be used to bring the extortionate state to reason. Prof. Walther Lotz, one of the best authorities on railroad management, has just published a book on "German Communications Since 1800," in which he attacks the popular notion that state ownership prevents monopoly. German experience shows the contrary.

NOT A SOLUTION OF MONOPOLY PROBLEM.

"Nationalization," writes Lotz, "is not by any means a solution of the monopoly trouble. Monopoly remains monopoly even if it is managed by officials. True, the state is claimed by nationalization enthusiasts to be a higher and unerring entity. But in reality the state is only the national organ of erring men, who are influenced by their virtues, their faults, their interests and their passions. And these influences are all brought to bear on railroad management quite as much when the state does the managing as when private persons do it. Indeed, in countries governed on party principles, privately owned railroads are often more bearable than state-owned railroads, as state-owned railroads are exploited as much as possible

*Berlin correspondence in Springfield (Mass.) "Republican," July 19, 1914.

†Note that this interesting review of Prussian railways was written just before the opening of the war.

for their own advantage by changing parties." And referring to plans of railroad nationalization in foreign countries, Prof. Lotz adds: "This is a reason against nationalizing the railroads in the United States."

What is just now being said against German railroads mostly applies to Prussia. "German" railroads, owned by the Federal government, on the lines discussed in the United States, do not exist, except in Alsace-Lorraine. The system is railroads owned by individual states. The Prussian state, or strictly, the organization known as the "Prussian-Hessian railroad community" is the biggest owner, for it possesses 38,000 kilometers out of the 62,000 in the whole empire. Bismarck aimed at nationalizing railroads on federal lines, but his bill enacting this was defeated owing to opposition by the middle-German and south-German states. At present the only bond between the different state-owned systems is article 42 of the constitution which obliges the states to manage their roads in the general interest of the empire.

Many think that this splitting up is the cause of the defects of German railroad nationalization. Instead of being controlled by the democratic imperial legislature in the general interest, the roads are controlled by the state governments and state legislatures which nearly everywhere are on a reactionary and class basis. This is particularly the case with the "Prussian-Hessian railroad community." The Prussian government is narrowly conservative and agrarian. The Prussian Diet, elected on a narrow, property franchise, is the same. Prussian government and Diet policy is agrarian. It aims at sparing the landowners in matters of taxation, at encouraging the export of grain which is practically bounty fed; and also at encouraging export by the "schwerindustrie," an ally of the agrarians, which controls, on trust principles, the production of coal and iron. The interests of the small trader and consumer are neglected. Prussia's railroads are governed in accord with this policy. She has low rates to favor the grain producer and the iron exporter; and high rates which hit the consumer on imported products.

RAILWAYS USED AS GOVERNMENT MILCH COW.

A greater objection to Prussia's railroad system is that it uses its monopoly to accumulate vast funds for the state finances. This is considered a breach of sound railroad management and is a violation of a promise. Thirty years ago, during the era of railroad nationalizing, Prussia's minister of public works promised the Diet

that the railroads would be run entirely in the interests of those using them, and not in order to make profits. "State railroads," he said, "are not a milch cow; they are not intended to be a source of state revenue."

He later promised that the railroad rates imposed would be only high enough to cover transport and maintenance and to pay a moderate percentage on the purchase debt incurred by the state. A similar promise was made in England in regard to the postal services, which were also not intended to help the state finances. Experience shows that governments are never able to keep such promises. The moment state finances run dry the state trading departments are resorted to as milch cows. Just as the English postal services are bringing in \$25,000,000 a year to help the state finances, so the Prussian railroads are bringing in over \$200,000,000 clear profit*† This vast profit is 36 per cent. of the gross earnings, a proportion probably reached by no other railroad system in the world.

LARGE EARNINGS FROM EXCESSIVE RATES.

Germans, who resent this system of exploiting railroads for gain, are not consoled by the fact that the \$200,000,000 goes into the state, not into private pockets. They object that the \$200,000,000 is not equitably imposed as a tax on all classes according to wealth. It is taken mainly from the nonprivileged classes, on whose traffic the railroad administration imposes heavy transport rates, while the roads carry the landowners' corn and the iron magnates' metal at very low rates, or even, as is suspected, at a loss.

The account books of the "Prussian-Hessian railroad community" for the past 30 years reveal how the state railroads have acted as milch cow for the state treasury. Between 1882 and 1912 over \$1,250,000,000 has been taken out of the railroad profits and handed over to balance the state budget. This transaction is made possible by the fact that the \$200,000,000 annual profit is far more than is needed to pay interest on and amortize the railroad debt. The profits amount to about $7\frac{3}{8}$ per cent. on the railroad debt. But the railroad debt was borrowed at about $3\frac{1}{2}$ per cent. Of the original railroad debt of \$2,875,000,000, \$1,085,000,000 is in consols,

*In Germany all additions, extensions and new equipment are capitalized.—S. T.

†"Clear profit" here is misleading. From this has to be deducted about \$122,000,000 interest on the State investment in railways, and the balance is barely sufficient to pay for the depreciation and additions to the property, which is not adequately maintained out of earnings.—S. T.

of which nearly all bear $3\frac{1}{2}$ per cent., but a small portion, 4. The state with its $7\frac{3}{8}$ per cent. from the railroads makes on this money a clear profit of nearly 4 per cent. The rest of the capital comes out of the "railroad extraordinary fund" and the "disposition fund," against which no interest-bearing consols are issued; and on this portion the state puts in its pocket the whole of the $7\frac{3}{8}$ per cent. earned.

In the matter of profits the state's appetite grows. Twenty years ago it was content with $5\frac{1}{2}$ per cent., which put a clear 2 per cent. in its pockets. When this caused objections, the government pleaded that, owing to the bad condition of the state finances, it could not do without the 2 per cent.; but it promised faithfully that the milch cow process should go no further. If profits, it said, showed signs of rising still further, they would be cut down by means of a general rate reduction. Despite this promise, profits were allowed to rise by yet another 2 per cent. on the capital invested; and the rates remained practically as before. This enormous profit did not result from management efficiency. Judged by American standards the management is not efficient. The ratio of expenses to receipts has steadily risen. The profit is due entirely to the vastly increased traffic, the carried freight being about $2\frac{1}{2}$ times greater than it was 20 years ago.

In addition to subsidizing out of railroads the ill-balanced state finances, Prussia has created from the same source a vast state property. This is shown by the railroad capital account. The railroad administration has written off an excessive amount of the original small capital outlay of \$2,875,000,000. Altogether \$750,000,000 has been amortized. So that of the original railroad debt only \$2,125,000,000 remains outstanding. This judged by European values, is a ridiculously small capitalization for 38,000 kilometers, nearly all double, treble, or even quadruple tracked, and splendidly equipped. As a fact, the present sale value of the state railroad system is appraised at \$5,200,000,000. The increase in value is due to the putting back into the roads of part of the profits; to extensions built out of profits; and to the natural rise in land and other values. The difference between the outstanding capital debt of two billion dollars odd and the present value of five billion dollars is the profit and property of the state.*

If the state were a private corporation it might point with pride to this result of 30 years' ownership, but the public would

*There is nothing in official German railway statistics to sustain the conclusion of this paragraph. In 1901 the capital cost of Prussian railways was \$1,937,000,000 or \$99,959 per mile; in 1913 it was \$2,997,000,000 or \$123,700 per mile!—Ed. Library.

complain and threaten, and ask why a railroad earning $7\frac{1}{2}$ per cent. and in addition creating out of profits capital values of three billion dollars did not reduce its rates? That is the complaint in Prussia. The state, say the complainants, should cut rates heavily; it should be content with the $3\frac{1}{2}$ per cent. which it itself must pay to borrow capital for railroad construction; and if its finances suffer, then let it mend them by imposing property taxes. The high railroad rates tax, not property, but business; and they tax heaviest the businesses which can stand it least.

The complaint is reinforced by the charge that the roads are not efficiently managed. Reichstag Member Gohre said that the state might cut rates heavily and still pocket its $7\frac{3}{8}$ per cent. if only it economized in management. Herr Gohre further showed that the roads are badly overofficialized. In the Cologne chamber of commerce it was stated last year that, counting passengers and train tons carried, the Prussian roads have $2\frac{1}{2}$ times as many officials as the American roads; and that they have five times as many clerical and other officials who do no physical work. "The bureaucratic management and the excessive staff would not," the speaker said, "be tolerated by a private corporation."‡

RATES NOT ADAPTED TO COMMERCE.

Most persistent of complaints is that the rates are fixed by bureaucrats who do not understand business; and are taught by their superiors that the rates should favor grain and iron exporters at the expense of other interests. Bismarck had a plan for letting the Diet fix the rates. This plan was not carried out. The rates are fixed by a nominated railroad council of state officials.

This railroad council invites the co-operation of representatives of the business interests; but the representatives are only advisers and have no decisive vote. The interests, however, bring sufficient pressure to push their points against nonrepresented interests. The chief of the railroads, Minister of Public Works Breitenbach, ascribes to this the high rates. He says that the interests themselves, in their zeal against competition, have prevented a reduction. Minister Thielen, a predecessor, said the same thing. He described the roads as "a morsel between contending dogs for which there is no parallel even in America, where the trusts exploit the roads in their own interests."

‡In the war German railways have fully justified the main object of their nationalization—viz., military highways.

Critics emphasize this weak side of railroad nationalization. They say that where roads are privately owned the rates are invariably controlled by some public authority, and this public authority is in turn controlled by the legislature, whereas in Germany the vital matter of rates is withdrawn from the legislature and handled by a handful of uncontrolled bureaucrats.

GERMANS BUILDING RAILWAYS IN BELGIUM

FROM THE RAILWAY GAZETTE, JUNE 18, 1915.

Behind the screen of the German lines in Belgium some exceedingly important projects are in progress, if we may accept Dutch advices as authoritative. The most interesting scheme is the construction of a new railway between Brussels and Aix-la-Chapelle, via Tongres, in building which the German engineers are showing the most absolute disregard, not only of the demands of cities and municipal authorities, but of the rights of property owned by individuals in the districts concerned. The construction of this railway by Germans is not without its ironic side. The scheme for the line is by no means new, and it had been greatly debated in the Belgian Press and Parliament prior to last August. The principal objections came from Liège, which considered that the line, which was planned to avoid the city, would seriously affect its trade and commerce. To a similar but smaller degree the Dutch city of Maestricht, which is close to the Belgian frontier, will also be affected. When the Germans have finished the line (if they ever do so) they are said to have the intention of using it to supplant the present international routes between Brussels, Liège, Verviers and Aix-la-Chapelle, and Maestricht and Aix-la-Chapelle. The completion of the line will give Germany yet another and better route for the transport of troops between Germany and Belgium, via Aix-la-Chapelle, which is one of the main nerve centres of her strategic railway system on the western frontier. But it has yet to be seen whether time and the Allies will enable the project to be brought to completion.

ITALIAN RAILWAYS IN THE WAR.

IN THE CHICAGO TRIBUNE, JULY 4, 1915.

PARIS, June 18.—Railroad travel in Italy has never been considered expeditious or comfortable from the American point of view, but the Italian railways have greatly improved in recent years. Otherwise it would have been physically impossible for Italy to have concentrated over a million soldiers with equipment and supplies on the northern frontier without any appreciable disturbance of the usual train service throughout the regions involved. It was a feat that an American traffic manager might have been proud of, given the restricted facilities of the Italian system. The troops were moved usually by night, and the long trains were sidetracked for the passenger trains on which the superior officers traveled.

The day before war was declared against Austria I made the journey north on the regular night express, which was filled with officers and Red Cross men and secret agents. The only restrictions were the warning not to prowl about the stations—one had to stay in the train or leave a station immediately—and the injunction to keep the window curtains pulled down after leaving Bologna. This was to prevent nonmilitary passengers from observing the passing of troop and supply trains, military preparations, etc., and it is needless to add was rarely obeyed by the curious Italians.

Venice, of course, was within the "military zone" and an important center of naval operations. The military zone extends at present from Bologna northward to the frontier and westward as far as Milan; within this zone everybody is subject to the military authorities, who without explanation can arrest or order the expulsion of any person they deem undesirable. Yet during the first days after the outbreak of the war, while the final mobilization was taking place, I found it perfectly possible to move about within this zone; the fast trains were running and approximately on time except on the frontier itself.

Throughout this disturbed period the railroad management, under the control of the military authorities, proved that in spite of the enormous burden put on the service they could do the business without unduly disturbing travel. For a day or two private telegrams were not accepted, as the wires were given over to military business. Letters went forward with some delay, and the parcel post was temporarily suspended.

THE RAILWAYS OF RUSSIA*

BY M. EDWARD THIERY,

EDITOR OF THE EUROPEAN ECONOMIST.

Russia is the most poorly equipped with railway facilities of any of the leading nations of Europe. In fact it has only about one mile of line for each 100 square miles of territory, a condition that acts as a severe handicap on Russian development, and it is vital to such development that the railway mileage should be increased.

The first railway to be built in Russia was that running from St. Petersburg to Tzarskoie Selo, a distance of about 16.5 miles, and was intended exclusively for passenger traffic. In 1842, when there were more than 3,600 miles of railway in Europe the Emperor Nicholas ordered the construction of the St. Petersburg-Moscow line, about 400 miles long. This was at the expense of the crown. Work was begun in 1843, but the road was not opened for traffic until November 1, 1851. In 1868 the line was conceded to the Grand Railway Company of Russia, but was reacquired by the state in 1868 with the balance of the company's system. There has followed a series of changing policies in the matter of railway construction. Up to the time of the Crimean war, all lines were built and operated by the state; but from 1857 to 1881, very few lines were built by it, recourse being had to private companies, the interest on whose securities was guaranteed. Then from 1881 to 1891 no more concessions were granted to private companies, but nearly all the new lines were not only built by the state, but it bought about 4,275 miles of road belonging to the companies. Since 1891, though the state built some lines, its energies were almost entirely absorbed in its Asiatic work, so that it reverted to an encouragement of the activities of the companies. The result has been a multiplication of companies and comparatively little railroad building by the state.

After the two great arteries of communication from St. Petersburg to Moscow, and from Varsovia to Vienna had been opened, the first to be built was that from St. Petersburg to Varsovia in 1851. It was started by the state, but the work was interrupted by the Crimean war, and was finished by a French company, the

*From condensed abstract printed in the *Railway Age Gazette* July 31, 1914.

Grand Russian Railway Company, which also built the Nijni-Novgorod line, about 1,050 miles, in 1857. This was the first large concession granted to a private company. Then, for a number of years, the government granted numerous concessions, besides giving financial assistance so that between 1867 and 1879 about 10,800 miles were opened, or an average of 900 miles a year, as compared with an average of 192 miles for the corresponding period from 1855 to 1867. In 1881 the construction of the Krivoi-Roy (Catherine Railway), 310 miles, was undertaken by the state and this inaugurated a period of railway construction and operation by the state. Between 1881 and 1891, the state authorized the construction of a few lines by companies already in existence, but no new companies were incorporated. On the other hand, the state bought 15 lines from the companies, with a mileage of about 4,275. It was during this period that a unification of the tariffs was undertaken. From 1891 to 1901 the state continued its policy of purchase. It took over about 10,100 miles of road from the private companies, including the Grand Company in 1894 and the Southwestern Railway in 1895. The total of the lines acquired by the state between 1881 and 1901 included 35 companies and 14,400 miles of road. During this same period the state built a number of new lines, both in Europe and Asia, and the ukase of the Czar Alexander III authorizing the construction of the Trans-Siberian Railway bears the date of March 17, 1891. The dates of the opening of the great Asiatic lines are as follows: Oussouri Railway, 1897; Siberian Railway to Irkoutsk, 1899; Irkoutsk to the Manchurian frontier, 1901; Trans-Caspian of the Central of Asia, 1899; Tachkent Railway from Orenborng to Tachkent, 1906. The total length of these Asiatic lines with their branches was about 6,775 miles.

While the government was engaged in this new construction, it granted a number of concessions to private enterprises and even gave up a number of its own lines to the same, so as to form homogeneous systems from an operating standpoint. In this way the following companies were organized between 1891 and 1895, and they still exist.

1. Moscow-Kazan Railway, incorporated in 1863 with 168 miles, and owning 1,610 miles in 1891.

2. Moscow-Kiew-Veronege Railway, incorporated in 1866; owning 294 miles in 1891 and 1,625 miles at the present time.

3. Vladicaucasus Railway, incorporated in 1872 with 600 miles, and has, today, about 1,560 miles and more than 400 miles of recent concessions.

4. Riazan-Ouralsk Railway, incorporated in 1865 with 460 miles, now operating a system of 2,700 miles.

5. The Southeastern Railway, incorporated in 1893, and now operating 2,140 miles.

6. Moscow-Windau-Rybinsk Railway, which from 1869 to 1895 operated but 185 miles, now controls over 1,600 miles of line.

Up to very recent years these six companies, together with the Varsovia & Vienna Railway, which was bought by the state on January 1, 1912 (the only purchase since 1902), operated about 97 per cent of all the Russian railways that were controlled by private companies. The state controlled 69.6 per cent of all the railways of the country in 1900, a proportion that has been maintained up to the present. On January 1, 1913, the situation was as follows:

State railways in Europe	22,250	53.8
State railways of Asia	6,775	16.3
Total	29,025	70.1
Private lines	12,409	29.9
Total	41,434	100.00

In addition to this construction was begun in 1912 on 3,850 miles, of which 2,640 miles were for the state and 1,210 miles for private lines. Beyond this, 37 new projects, representing about 2,980 miles, were submitted in 1912, all of which were favorably reported by the commission of new railways. Finally the commission has laid out a program of construction, extending through five years, of at least 18,000 miles.

Besides these main lines, there are a number of purely local lines, the mileage of which has grown from 1,175 miles in 1902 to 1,400 miles in 1912.

The following figures give the cost per mile of line for both the state and the private lines:

Year	State		Private	
	Mileage	Cost per mile	Mileage	Cost per mile
1898.....	18,040	\$54,075	9,237	\$53,560
1899.....	20,117	50,830	10,455	50,367
1900.....	22,317	51,500	†	†
1901.....	23,601	52,170	10,800	48,000
1907.....	27,634	57,330	11,735	50,212
1908*.....	28,032	57,268	11,804	51,088

*Last official report available. †Report incomplete.

From these figures it appears that the cost of the state roads was more than of the private, but it must be taken into consideration that the proportion of double track was more on the state roads, being 28 per cent of the whole, whereas on the private lines it was but 13 per cent.

The number of passengers carried rose from 15,500,000 in 1897 to 54,400,000 in 1911. The average number of passenger miles per year from 1897 to 1901 was 1,661,880,000, while from 1907 to 1911 it was 3,178,560,000. If these figures are taken on the basis of mileage operated, they would show an increase of 44 per cent in density. In freight traffic the annual ton mileage rose from 5,402,964,600 in the period from 1897 to 1901, to 9,651,751,560 in the period from 1907 to 1911. Taken on the basis of mile of line operated the density of traffic rose from 415,800 to 558,360 ton-miles, an increase of 34 per cent.

The cost of operation was only 58 per cent of the gross receipts in 1897, but it rose steadily up to 66 per cent in 1901. During the Russo-Japanese war and the internal political trouble that followed, the falling off of traffic produced a marked increase in the ratio, which rose to 73 per cent in 1907, and since that time, because of the rapid increase of traffic, has fallen to 56 per cent.

On the European lines operated by the state the passenger traffic increased 53 per cent and the freight 25 per cent from 1897 to 1911.

The disappointing part of the state operation is that while the gross receipts of the private companies increased 41 per cent, and their operating expenses only 40 per cent, the gross receipts of the state lines increased 22 per cent, and their operating expenses 35 per cent.

Railway operation, in Russia by the state, then, was much more expensive during the 1907-1911 period than it was by the private companies. In fact, the ratio of expense to gross receipts on the European system of the state ran from 62 to 69 per cent, while with the private companies it remained stationary at 62 per cent. During the past four years the state management has succeeded in gradually lowering this percentage to 57.6, while the private companies have reduced theirs to 55 per cent.

The principal Asiatic lines were opened and put into operation in 1902. The period of partial operation from 1897 to 1901 was one of loss, so that it is only from 1907 to 1911 that the system can be considered as complete and homogeneous. But, the earlier years of this period were seriously affected by the liquidations of

the Russo-Japanese war, so that it was not until 1910 and 1911 that there was any appreciable profit. In 1908 the operating ratio was 108 per cent, and this was reduced to 83 per cent in 1911, due to an increase of receipts and decrease of expenses. Russia has great faith in the future of the Asiatic system, which is expected to develop the immense territory in which it is located and whose fertility is very great. In 1913 the Trans-Siberian lines had a mileage of 4,165 miles and the Trans-Caspian lines of 6,800 miles.

From the lines comprised in the above mileage, numerous branches have been planned and authorized, which will run into the southern part of Siberia and to the center of Turkestan. It is thought in St. Petersburg that, within the next seven or eight years, the Asiatic system will consist of from 10,000 to 10,500 miles, and that the receipts will quite suffice to pay all fixed charges on the capital invested.

Because of the interest guaranteed on private lines under different forms and at different times, as well as the payment of interest and amortization of capital on the state railways, the Russian treasury has been called upon to make contributions of very considerable amounts, so that starting in 1898 it was not until 1910 that the receipts exceeded the expenditures.

The report of the minister of finance to the Douma in 1913 shows for the years 1908, 1909, 1910 and 1911 the net annual receipts of the state railroads rose from \$67,936,000 to \$155,751,000. But the question at once arises as to whether these net receipts, large as they are, are sufficient to meet fixed charges. In this case the capital has been obtained from two sources:

1. The sale of bonds in the home or foreign markets.
2. The issuance of government bonds.

For the past 20 years these bonds have been cared for by the annual budget, but they must be regarded in the same way as though the funds had been borrowed from the public. The interest and amortization of the capital so obtained form a state obligation and are part of the public debt. In the case of the government bonds, the comptroller of the Empire debits the state system each year with a theoretical $4\frac{1}{2}$ per cent on the total capital employed.

Thus at the end of 1911, the capital represented by the Russian State Railway system amounted to \$2,612,595,000 divided into A, \$1,379,178,000 and B, \$1,233,417,000 of treasury obligations. To meet the interest and amortization of capital A, an annuity of \$56,444,000 was put upon the budget of 1908, or 4.09 per cent of the

capital in circulation. The theoretical annuity upon capital B calculated at $4\frac{1}{2}$ per cent requires, in round numbers, \$55,500,000.

The difference between the net receipts of operation, \$155,787,500, and the annuity, \$56,444,000, or \$99,343,500, represents the real net receipts of the state. But if the state had also been obliged to pay, as a private company would have been obliged, the $4\frac{1}{2}$ per cent for interest and amortization on the capital which the treasury had furnished gratuitously, amounting to \$55,500,000, its profit would have been reduced to \$43,843,500.

In 1913 passenger rates were raised, and these rates are the same on the state and the private railways. They are based on a differential sliding scale, and the present rates for first-class passengers are as follows: 2.9 cents per mile for the first zone of 100 versts (66 miles); 2.7 cents per mile for a zone of 200 versts (132 miles); and 2.5 cents per mile for a zone of 300 versts (198 miles).

On express trains an extra charge of about 10 per cent is made, and if the passenger wishes to reserve a chair in a first or second-class compartment, a reservation ticket is obtained at a cost of from 40 to 75 cents. To occupy exclusively a two-passenger compartment for the night, the first-class passenger will be required to pay about \$3 instead of 76 cents, to which must also be added one rouble (51.5 cents) for bed clothes and a pillow. Passengers have the right of free transportation for 36 lbs. of baggage.

On both the state and the private railways the monthly wages of locomotive engineers range from \$67 to \$82.50; those of firemen from \$56.50 to \$67, plus certain premiums paid for economy of fuel and oil and for good service. The pay of trainmen runs from 76 cents to \$1.30 a day; that of track laborers is quite variable, running from 57 to 62 cents a day in the provinces to about 76 cents a day in the large cities. The railway employes are granted a pension on retirement proportioned to the number of years of service and the salary received during the last year. They also have the right to a day of rest each week.

In Russia there are no associations of engineers or other railway employes, as such associations are expressly prohibited by law. Hence, with the exception of the strike of 1905, which was really a political demonstration, there has never been a strike or an attempt at a strike on the Russian railways.

Russian locomotives burn wood, coal or oil, according to the region in which they operate. On the Baltic and Northern lines they burn wood. This is also the case on the great Nicholas line running

from St. Petersburg to Moscow. Along the Douetz and upon the roads running from Moscow to Varsovia and the German frontier by way of Smolensk and Brest, and on the lines into Little Russia, Kiew and Odessa, they burn coal from the Douetz or Dornbrova. But on lines within easy transportation distance of the Volga, oil is used.

The economic development of Russia has been more rapid than the increase in its production of fuels, so that, for the past ten years, the prices of wood, coal and oil have steadily increased, thus handicapping industries and putting a burden on the inhabitants of cities, where the cost of heating has almost doubled. In consideration of the effect of this condition on manufacturing and the railways, the minister of commerce and industries has just submitted to the vote of the Douma a proposition to cancel the duty for one year on the importation of foreign coal, intended for public service of the railways. Now the duty, which is only 47 cents per gross ton at St. Petersburg and the Baltic ports, rises to \$2.03 per ton in the Black Sea ports and the Sea of Azov, where foreign coals could readily compete with those of the Douetz.

During the past few years, railway operation in Russia has made great progress both on the state and private lines. It is still a subject of discussion as to whether it is better for the state to reserve to itself the sole right of railway construction and operation, or grant the rights to private capital under certain reserves of guaranteed interest and state control. Under certain circumstances the state monopoly idea has prevailed, under the pretext that it tends to a more impartial service of the national interests. Those who favor private companies contend that their management is less arbitrary and less expensive to the public in the end than that of the state. Finally they have come back to the state system since the question of national defense has become so important, because it is thought that the problems of strategic railway construction best adapted to the rapid mobilization of troops can most properly be solved by the state.

Count Witte, the former prime minister, with whom railway matters were of the first importance, said, in an address in 1910, that after many years of deficit, the Russian railways had at last returned an income to the treasury in the period from 1895 to 1900, but that this had been again followed by a period of deficits because of the considerable mileage of strategic railways that had been constructed. "In countries," he said, "where political or military pur-

poses control the location of railways, and Russia stands in the front rank of such countries, it is quite the custom to build strategic lines, knowing full well that such roads will not be on a paying basis for a number of years. Between 1889 and 1904, 17,435 miles of railway were authorized and construction thereon begun. Out of this I put 4,030 miles as being incontestably strategic, or 23.1 per cent, and 14.5 per cent as being purely political, such as the Astrakan Railway. It is quite evident that if these roads had not been built, and if they had not been operated, the general deficit of our railways would have been considerably diminished."

Count Witte's ideas were evidently shared by his successor, M. Stolypine, and they certainly are by M. Kokovtsoff, the actual head of the government, and by the Czar himself. In fact, since 1910, and especially since the accession of M. Kokovtsoff to power in 1911, a fresh impulse has been given to railway construction, for more than 4,600 miles have actually been started or authorized.

BRITISH RAILWAYS DURING THE WAR

BY H. J. JENNINGS.

CONDENSED FROM THE NINETEENTH CENTURY.

The British railway reports for 1914 are of exceptional importance, not only to the stockholders but to the general public as well. Although the conditions in which the railways have been operated prevent comparisons of the details of receipts and expenditure with those of the previous year, the general results in each case throw an interesting light upon the influence of the war, and the interposition of the government, upon the traffics, profits and dividends. It is disappointing but inevitable that the accounts should be presented without many of the usual statistics. This is the first occasion, since the adoption of the new system of annual instead of half-yearly accounts and of uniformity of abstracts, on which it would have been possible to compare the details of one whole year with another. The abnormal conditions of the last five months of the past year have prevented the presentation of the accounts in the ordinary way, and in any case many of the figures would have been only superficially comparable. During those five months the companies were working under government control (a warrant having been issued under an Order in Council empowering the President of the Board of Trade to take over the railways), and their ordinary business had to be subordinated or postponed to military exigencies. The expeditious movement of troops and war materials in time of war is of infinitely greater importance than the interests of individuals or even of trade as a whole, and such expeditious movement was only made possible by means of a central organization and the co-ordination under government control of the military and railway administrations. Precedence had to be given, and facilities afforded, to trains conveying troops, guns, ammunition, food supplies, army clothing, horses, motor-vans, and everything else required for the war at home or abroad. This precedence is analogous, on a large scale, to the regulation in London and other big cities whereby all ordinary street traffic is held up, or voluntarily gets out of the way, when a fire engine is signalled. The necessity for keeping main lines clear for the transport of soldiers unfortunately involved the shunting of a great number of trucks of coal and provisions on to sidings, where they became congested and thus helped in conjunction

with a scarcity of wagons to bring about temporary shortage and higher prices. These are consequences that could not be avoided and had to be endured with patience. The military situation and military necessities were the main things that mattered. *Salus reipublicae suprema lex.*

Since the 5th of August all the principal British railways have been worked according to the regulations of an executive committee of general managers with the President of the Board of Trade as chairman, whose duties are to control and direct the traffic so as to meet the requirements of the War Office and the Admiralty. This committee has provided the machinery and regulates its work. In time of war a country's railways are of the utmost strategic importance. Most of those continental countries—namely, the principal states of the German empire, Belgium, France, and Russia—whose railways are either wholly or partly state-owned, had in existence, when war was declared, organizations for automatically transferring the control from one state department to another. The Prussian system worked like the mechanism of an accurate clock. In Great Britain, where our methods are of the more happy-go-lucky kind, the virtual transfer of direction to a composite committee, in which the government had the ruling voice, was so unexpected that at the beginning there was bound to be some confusion. This, however, is only one of the departments in which we found ourselves in the customary state of unpreparedness when faced with the most momentous struggle in our history. The comparative smoothness which has been evolved from the *mêlée* at the outset deserves the grateful recognition of all classes of the community.

The government acted under the Regulation of the Forces Act (1871), in the terms of which interposition involved a certain liability. They foresaw the disorganization of the companies' finances that would be caused by the holding up of ordinary traffic, and the injury which it would inflict on the stockholders, and as a matter of elementary justice, as well as of legal obligation, they undertook to recompense stockholders for this loss. The Act provides that full compensation shall be paid to the owners of the railroads for any loss or injury they may have sustained through the government taking possession, the amount of such compensation to be settled by agreement, or, if necessary by arbitration. In September last the Board of Trade issued an official memorandum on the subject:

His Majesty's Government have agreed with the railway companies concerned that, subject to the undermentioned condition, the compensation to be

paid them shall be the sum by which the aggregate net receipts of their railways for the period during which the Government are in possession of them fall short of the aggregate net receipts for the corresponding period of 1913. If, however, the net receipts of the companies for the first half of 1914 were less than the net receipts for the first half of 1913, the sum payable is to be reduced in the same proportion. This sum, together with the net receipts of the railway companies taken over, is to be distributed amongst those companies in proportion to the net receipts of each company during the period with which comparison is made. The compensation to be paid under this arrangement will cover all special services, such as those in connection with military and naval transport rendered to the Government by the railway companies concerned, and it will therefore be unnecessary to make any payments in respect of such transport on the railways taken over.

A statement made by Mr. Curtis Bennett, representing the Great Western Railway Company at an inquiry held at Fishguard in January, has been construed to indicate a rather wider range of responsibility in financial control than the foregoing summary would lead one to imagine. He said that as "every penny taken on the British railways went into the coffers of the government," the Board of Trade and not the companies were liable for any breach of regulations. This statement has been interpreted in one quarter as implying government ownership, whereas all it means is that the government having become guarantors have pooled the receipts for the purpose of making such proportionate contributions as are allotable to the different companies. The net receipts of the companies themselves, plus the amounts paid by the government, are divided amongst the companies according to their 1913 profits. If the arrangement of September had been adhered to, the modification caused by any falling-off during the first six months would have been operative; but it was announced two or three weeks ago that, in connection with certain wages adjustments, the government surrendered its claim to reduce the aggregate net earnings in the proportion of the first six months. It is understood that this reduction was rather under 3 per cent, and the net profits are now to be fixed on the 1913 basis, less 25 per cent of the war bonus to be paid to the railwaymen, to which reference will be made later.

The idea that the government had guaranteed dividends, somewhat widely entertained at one time, had, of course, no foundation in fact. All that they guaranteed was an income out of which dividends could be paid. It was very desirable, as Mr. Cosmo Bonsor (Chairman of the South Eastern and Chatham Managing Committee) pointed out, that an arrangement with regard to the basis of compensation should be such as to eliminate as far as possible any

conflict of interests between individual companies, and also to avoid all questions as to the services to be rendered by the companies and the charges for such services. It was felt that the only satisfactory arrangement was one under which the government should get the benefit of all traffic receipts and bear the burden of the expenses, handing over a certain net revenue for distribution among the companies. If an arrangement had not been reached the whole question of compensation would have had to go to arbitration, and might have been postponed, to the great detriment of the stockholders, until the war is over. Hence the existing arrangement, which is happily described by Lord Allerton, Chairman of the Great Northern, as "a universal pool among the controlled companies of the whole of their net traffic receipts." To a great extent this involved an interchange, virtually amounting to a pooling, of rolling stock as well. Never in the course of their history have the railway companies worked together with such a singleness of endeavor for public ends. The question naturally arises whether this unanimity of effort, which is imperative in war time, could not be brought into operation in the interests of the community, by means of a great scheme of co-ordination and central control, when the war is over.

If the arrangement had not been modified, it would have been impossible to arrive at the government's liability without reference to the net earnings between January and June, inasmuch as it would have been essential to know in the first place in what relation the net receipts for the first half of 1914 stood to those for the first half of 1913; and in the next place, what were the figures of revenue and expenditure from the 5th of August to the 31st of December. The first factor we practically have, but the second is wanting. As regards the first half of the year, the reaction in the iron trade during the six months from the 1st of January to the 30th of June, and the still more serious inactivity in the cotton trade, had an injurious effect on the Northern goods traffic. For those months most of the heavy railways had decreases in their gross traffic receipts, as published week by week. The Great Western (which had 106,000*l.* to the good) and the Great Northern were fortunate in being exceptions, and the Brighton, the Great Eastern, and the two Metropolitan companies also had increases. The decreases ranged upwards from 1,287*l.* for the South Eastern and Chatham Joint Committee, those of the bigger companies being considerable. For example, Lancashire and Yorkshire's decrease was 95,300*l.*, the North Western's 81,000*l.*, the Great Central's 72,800*l.*, the Midland's 64,-

000*l.*, the North Eastern's 39,000*l.*, the Hull and Barnsley's 42,262*l.*, the Caledonian's 21,100*l.*, and that of the Furness 14,584*l.* The weekly statements have, however, a knack of under-estimating the gross takes; allowing for this they show that the government's contribution on account of the five war months would have had to be trimmed in some cases—not in all—in proportion to the decrease in net earnings of the first six months. Roughly, the working expenses of the bigger companies for the first half of the year average about 65 per cent, and upon this basis it might have been possible to get some sort of idea—conjectural, it must be confessed—of the net amounts to be considered in adjusting the government's contribution. Any comparison of the traffic receipts is enormously affected by the stipulation that, during five of the twelve months with which the reports deal, no government payments were made for transport on the railways taken over. Fortunately, in the interests of simplification, these complications need not now trouble us. It may, however, be pointed out that the companies which suffered most in the first half of 1914 will benefit by the new method of averaging the net receipts. The North Western, the Great Northern, the Great Central, and the Lancashire and Yorkshire, all of which were affected by the South Yorkshire coal strike, and some of the southern lines, such as the South Eastern and Chatham and the Brighton, should have better individual results; but these benefits, it must be remembered, will be spread over the remaining companies as a consequence of the pooling arrangement.

The dividend announcements have put to rest a good deal of speculation about the financial effect of the war conditions on the stockholders' interests. With the exceptions of the Lancashire and Yorkshire and Great Eastern, which maintain their 1913 dividends, all the companies make smaller distributions. Generally speaking, the reductions, as already indicated, have an evident relation to the drop in gross receipts during the first six months. The Lancashire and Yorkshire, however, is a striking exception. It had the heaviest decline for the period referred to, but over the whole year what was lost in traffics was more than made good by reductions in cost of working, so that the net receipts for 1914 were actually better than those for 1913. Some boards of directors appear to have taken a more conservative view than others, and the number of instances in which the reserves and undivided profits have been increased testify to the anxieties involved in reaching a decision, combining equitable treatment for the stockholders with a prudential regard for the future.

Apart from the interest felt in the dividend question, there is the other always instructive subject of the detailed comparison of the year under review with its predecessor, and this, notwithstanding the dissimilarity of the conditions and the lack of many important statistics, will be found to furnish some suggestive information. It is intended in this examination to deal with the principal companies in England and Scotland, companies representing in the aggregate a capital of more than 1,100,000,000*l.*, and paying in stock dividends, over and above debenture interest and other fixed charges, on the average considerably more than 30,000,000*l.* a year. They represent, taken together, about six-sevenths of the entire railway business of the United Kingdom, and are, therefore, in ordinary circumstances, as faithful an index of trade conditions as can be got, and a sort of microcosm of much that pertains to our economic well-being. Their accounts reflect better than any other set of accounts the ups and downs of national prosperity, and a comparison of the figures for 1913 and 1914 shows at a glance the measure of the war's disturbing activities. It will be seen that such local undertakings as the Taff Vale, the Furness, the Barry, and the North Staffordshire companies are included. They serve districts intimately connected with important industrial interests and are, therefore, equally as good indices, in proportion to the volume of their business, as some of the bigger lines. The Metropolitan and the Metropolitan District Companies are also brought in, for although they are purely London, or Greater London, undertakings, and although they are worked by electricity instead of by steam, they help all the same to throw a light on the passenger traffic. The Metropolitan, it should be observed, was one of the companies not affected by inclusion in the government control.

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The accounts formerly numbered 10 to 17, inclusive, and abstracts A to J, inclusive, are omitted this year under authority of the Board of Trade. This policy withholds from the stockholders a good deal of information which might very well have been given. There is, for instance, nothing in the new conditions which makes it necessary to suppress particulars of the amounts paid for local rates, government duty, national insurance, and passengers' compensation. Nor is there any apparent reason why the number of civilian passengers carried, as well as their classification, should not have been stated. Admitting that details of passenger and goods traffic would have been of but little use for the purposes of

comparison, they would still have had considerable interest and a positive value. The lack of abstracts dealing with the maintenance of the permanent way, the rolling stock, the locomotive running expenses, and the traffic expenses, also of the accounts of the subsidiary enterprises of steamboats, omnibuses, docks, canals, and hotels, rob the reports of a good deal of their statistical interest. No complaint, however, would be reasonable on this score, since the same derangement which has affected the train service has equally affected the docks, harbors, etc.

The Lancashire and Yorkshire, the South Western, the Great Eastern, and the Metropolitan were the only companies to have a better net income than for 1913. The heaviest decline is in the case of the North Eastern, whose big decrease in gross receipts was accompanied by an increase in expenditure. It is rather curious that whereas the Lancashire and Yorkshire with a gross traffic decrease of 100,000*l.* saved 110,000*l.* in working expenses, the North Eastern with a traffic decrease of 158,000*l.* increased its expenditure by 89,000*l.*

The absence of the usual abstracts makes it impossible to show what the expenditure has been on the two most important items of coal and wages. A year ago several of the reports laid stress upon the increased coal bills arising out of the miners' wages settlement, also upon the advance in the companies' own wages list caused by the concessions made during the great railway strike. All that can be said about the wages question is that the numbers employed have probably been reduced in the second half of the year by the absence of many of the men with the Colors. So far as can be calculated from the authentic figures supplied by some of the leading companies nearly 70,000 men* have gone from the railways of the United Kingdom to one branch or another of the services. The London and North Western heads the list with 11,449; the Great Western comes next with 9,462; the Midland has supplied 7,530 (to the 14th of November); North Eastern, 6,000; Lancashire and Yorkshire, 4,016; Great Northern, 3,050; Great Eastern, 3,572; Great Central, 3,333; South Western, 2,100; North British, 2,000; South Eastern and Chatham, 2,000; Caledonian, 1,870; Brighton, 1,895, and so on.

Even if the detailed figures of wages had been given in the abstracts, they would only have been useful for comparison with those of the previous year and no sufficient criterion of the expenses of the

*The number at latest accounts was over 80,000.

current year. A rise of wages to last as long as the war lasts has already been announced. With the cost of living greatly increased and the balancing of the domestic budget becoming more and more difficult, there was nothing at all surprising in the agitation of the railway employes for a higher scale of wages. After several conferences between their representatives and the managers' committee with the concurrence of the government, a compromise between the offer of the companies and the 5s. asked for by the men was reached, it being agreed that a war allowance or bonus of 3s. per week for those receiving less than 30s., and 2s. per week for those receiving 30s. or more should be paid for the period of the war. This will add somewhat about 4,000,000*l.* per annum to the wages bill, one-fourth of which will fall upon the companies, the remaining three-fourths being borne by the government; and in consideration of this arrangement the government have modified their claim under the September agreement, as already explained in this article. No reasonable person will grudge the railwaymen this concession. Apart from the extra cost of living, which has necessitated the fixing of new standards, they have worked hard during the critical time and have won the hearty praise of Lord Kitchener. It is not too much to say that the country is greatly indebted to them for their public-spirited devotion to duty, at the cost of the great strain on their physical endurance, by which alone the punctual execution of our military preparations was made possible. Trade union regulations as to the hours of work and overtime were suspended without protest. The demand for an advance, therefore, was not a case of holding a pistol at the head of the companies at a time of stress and difficulty; it was the legitimate outcome of a unique situation and called for consideration in a large and equitable spirit. Many other classes of labor have benefited pecuniarily by the war, but the railwaymen, although they were called upon to make these exceptional exertions, had to be satisfied during several months with the wages of normal times, notwithstanding the abnormal demand on their resources caused by the much higher cost of living. An inevitable effect of an increase in the wages bill, although the companies have to pay only a part of it, will be a corresponding increase in the expenditure for 1915; but the government's acceptance of most of the liability may simplify the situation. It amounts, at any rate, to a virtual admission of the national character of the railways in war time, and of the exceptional claims of the employes, and in these respects as well as in that of relieving the stockholders to some ex-

tent of the additional cost, it has a significance that cannot be overlooked.

It will now be interesting to see what the differences in dividends mean in actual money to the stockholders. Unfortunately, the aggregate is considerable; unfortunately, because just when the tax-gatherer is most urgent the means of satisfying him are undergoing a severe shrinkage.

In round figures there will be distributed by the companies included about 1,180,000*l.* less for 1914 than for 1913. If the differences on the other lines be taken into the reckoning, the full loss will nearly approach the sum of a million and a quarter. Although this, spread over the whole body of stockholders, does not show a formidable sum per head, it is of sufficient magnitude, taken in conjunction with the drop in other investment dividends, to make an appreciable difference in the spending power of the investor. The state, furthermore, will be sufferers from the smaller amount on which income tax is payable.

The figures of capital expenditure for the year are included in the same table. No matter what the conditions are, the policy of expansion goes on, and the capital expenditure is ever on the increase. Whether this is an altogether wise policy, when the whole future of the railways is obscure, is a question for stockholders themselves to answer.

The efforts that are being made in some quarters to build upon the tentative Government control—if Mr. Runciman will pardon the word—a superstructure favorable to ultimate State ownership cannot be said to have any sufficient warrant. Without denying that the facts set forth in the earlier part of this article have a bearing upon such an issue, that bearing may easily be exaggerated. Many serious considerations must arise, and many initial difficulties be cleared away, before a State purchase of the whole vast and costly railway system of the country can be seriously contemplated. So far, the most that recent experience has shown is the ability of the Government to give due preference to the paramount needs of the situation and to deal judiciously with the labor side of the problem. It is difficult to see how State purchase is brought any nearer by this experience. The more vital questions of the permanent relations of the State as employer, of the creation of a huge new national investment, and of the success or otherwise of other State-managed commercial undertakings, are barely touched by temporary measures contrived for a particular end. If State ownership be ever

thought practicable and desirable, there is an Act already in existence which lays down the terms of purchase on which the railways would have to be acquired. These terms are based on the average net receipts of the three preceding years, capitalized at so many years' purchase, and even if there were no doubts concerning the interpretation of some difficult points, the application of the principle would mean an investment of public money on such a scale that the market value of the existing funds could not fail to be gravely prejudiced by the new rivalry. With a great war on our hands and the prosperity of the country likely to experience a protracted set-back, a proposal that the State should buy up the railways, whatever might be its abstract merits, would be, to say the least of it, inopportune. Some day or other public opinion may demand the nationalization of the railways; for the present, however, the subject has only an academic interest, and the various deductions that have been drawn from the Government's exceptional action with a specific object are, for any practical purpose, premature.

THE WAR AND WALL STREET* AND, INCIDENTALLY, THE RAILWAYS

BY W. C. VAN ANTWERP.

This audience still retains, and will always retain a vivid impression of the opening weeks of the devastating conflict in Europe which began in the last days of July. The world has never experienced such a shock, nor has it ever been so pitifully stricken.

Although a general war in Europe had been discussed again and again since the Peace of Paris forty-three years ago, with recurrent apprehensions over Afghanistan in 1884, Constantinople in 1885, Fashoda in 1898, Morocco in 1911 and the Balkans in 1913, no such crisis as that which we are now witnessing was seriously contemplated. It was talked of as men talk of the infinity of space; it surpassed imagination. When it suddenly burst upon us we were unable to grasp its staggering significance. Like bewildered spectators of a monstrous confusion, we were but dimly aware that a new and incomprehensible tragedy was shaking the world to its base.

When the blow fell, no portion of the globe outside the actual zone of war felt it more acutely than Wall Street, and it is of Wall Street's part in the tragedy that I am here to speak. Let us therefore select from the riot of daily occurrences the significant incidents that most directly affected us through Wall Street's various channels, and arrange these occurrences in their relation to each other. In this way we shall become intelligently conscious as to what has happened, what the premonitory symptoms were, how they were received, what they have taught us, and what lies ahead. Perhaps we shall learn, too, how well or how ill those entrusted with large responsibilities in the Nation's financial center have performed their tasks.

Looking back over this short but frantic interval we find that the world's great Stock Exchanges first gave warning of the coming storm. These sensitive barometers first felt and reflected the portentous significance of military armament and the gradual piling up of gold in the world's financial centers; \$100,000,000 added to the reserves of the Reichsbank, \$150,000,000 to the Bank of Russia, \$170,000,000 to the Bank of France, while the price of securities all over the world paused, and began to fall. This was the situation during the year before the storm burst.

*An Address before the City Club of Rochester, N. Y., Nov. 14, 1914.

Historians who are to write of this epoch may look upon the murder of the Austrian Archduke Francis Ferdinand, June 28, 1914, as the spark which exploded the magazine, but the Stock Exchanges and Bourses which in a charged and sullen atmosphere take their bearings by dead-reckoning, had already warned us that the long-smouldering jealousies, race hatreds, and distrust among nations which for many mad years had found expression in the armament mania, were driving Europe toward the abyss. If the incident at Sarajevo had not occurred, something else would have served the purpose. Preparation for war had reached the breaking point; it could not go on and it could not stop. Peace had become a luxury too expensive to be borne. Bankruptcy or war was inevitable.

Through July events moved quickly. Those who watched in Wall Street saw Consols easing off and all international markets turning heavy. Lombard Street discounts rose. "There is an uncomfortable feeling prevailing here," was the message cabled to New York by a very conservative observer in London on July 21st, but precisely why or wherefore no man knew. Two days later, July 23rd, matters grew worse. In New York sterling exchange moved upward with great rapidity; Paris bid almost frantically for gold; all Europe sold heavily in the security markets; British and French Government bonds fell portentously. There were vague rumors of a censorship of dispatches from Vienna; an unnoticed but very significant news dispatch recorded the fact that Servian Government bonds had fallen four per cent in a day. Yet with all these portents of evil, which clearly implied diplomatic interchanges of serious purport, the business world was incredulous and unready. Not one man in a million suspected what was coming; even the wisest were caught off their guard; but the Stock Exchange barometer told the story, with a dumb precision that neither thinks nor judges, but merely perceives. The action of these delicate, highly sensitized mechanisms in the closing days of July reminds one of Kant's observation on the senses: "Our senses do not deceive us, not because they always judge correctly, but because they do not judge at all."

The Statist of London said on July 25th, two days after Austria's ultimatum to Serbia and but three days before Austria's declaration of war, "We do not think that there is any reason for exaggerated fears;" and, again, "We do not seriously believe that there is dan-

ger," and, again, "We feel persuaded that the Great Powers are, without exception, intent upon maintaining peace," and that "the whole influence of Europe will be used to prevent any unwise action." On the same day *The Economist*, of London, similarly incredulous, asked "Where would the money come from with which to carry on a war?" Two days later, July 27th, with all the Continental stock markets suffering a devastating panic, a cable dispatch from Lombard Street to New York, written by an authority famous for his accuracy in such matters, said "The best financial opinions here believe, or rather hope, that the European scare has been overdone." The European banks, even that grim day, made no advance in their official discount rates, a step which they would have been quick to take had they looked upon war as imminent. There could be no more striking evidence than this of Europe's unreadiness, and especially of that of London and the Bank of England, where, after making allowance for the necessity for calm counsels, the Bank must infallibly have taken cognizance of the impending disaster had its Governors, or the Government of the Empire, but dimly foreseen it. Yet on that day \$12,000,000 in gold went out from New York to London at rates which expressed the fear of shippers and insurers that a hostile fleet might intercept it on the ocean, while prices of securities again crashed all over the world, and American wheat rose seven cents a bushel. On the next day, July 28th, Austria declared war on Servia. Hostilities began at once; from that time forward titanic forces of death and destruction were unloosed.

In ten days following Austria's declaration of war \$45,000,000 of American gold went out. All Europe demanded, instantly, all its credit balances, while simultaneously ceasing to pay its own debts through a resort to the moratorium. New York thus became the only market for gold in the world, and the lack of protection by concentration which makes our store an easy prey to other nations in times of peace, became a source of peril when to that difficulty was added the emergency of war.

Another difficulty even more grave confronted our bankers in this crisis, one that has not yet been solved and one that will not be solved in this generation. I refer to that inherent weakness in the financial position of the United States with reference to other nations as represented by our stupendous debt to Europe. Although we have normally an apparent credit balance in trade of over \$500,000,000 annually, we have in fact other annual international debts

of at least twice that amount, so that our boasted trade balance not only is wiped out, but balance accumulates against us which might compel us to export at least \$500,000,000 in gold to pay our debts each year. This debt grows out of items which are not included in the trade balances. I was informed recently by Sir George Paish, who is now visiting this country in his capacity as assistant to the Chancellor of the Exchequer, and who is a recognized authority on large matters of international economics, that the net debt of the United States to Europe amounts to about \$600,000,000 a year. Of this staggering total \$300,000,000 arises from interest and dividends on American securities, \$200,000,000 from the heavy expenditures of our tourists, and the balance from imports, freights paid to foreign vessels, premiums paid for foreign fire and marine insurance, incomes paid to the estates of our expatriated American men and women, and many similar items. Thus the tables are entirely turned against us, and instead of an annual trade balance of \$500,000,000, we have an annual net debt of \$600,000,000.

It is well understood that Sir George Paish came over here to collect or to arrange for the collection of a part of this debt. We had always known that we owed it, but Europe had never exercised its power to collect it, finding it more profitable to buy our good securities than to withdraw our gold. Like spendthrifts, we as a nation had thus continued to pile up our obligations with careless indifference to consequences. When, therefore, Sir George had explained that Europe could no longer buy our securities and that a drain upon our gold reserves was inevitable, a gentleman who had listened to him stated the case exactly when he said, "The sheriff, with a writ, is on the door-step."

Confronted with the difficulty of meeting an immediate and inevitable drain of gold the anxieties of Wall Street bankers may be better imagined than described. All other difficulties, for the moment, became relatively insignificant. At the very outset of war sight exchange on London, normally \$4.86 and almost never higher than \$4.89, rose to \$5.00, then to \$6.00, and finally to \$7.00,—a rate never before witnessed. That persons could be found, hat in hand, begging for the privilege of paying \$7.00 for \$4.86 shows how completely our machinery of exchange had broken down. We were not only heavily in debt, but the normal vehicles of commerce were stricken with a palsy and insurance on gold in transit was almost unobtainable. With all the energy, all the money, all the credit of

the five richest nations in Europe, numbering over three hundred millions of people, suddenly devoted not to production, but to destruction,—not to saving, but to wasting, we alone among the nations began to pay as best we could, and paid in gold, while nobody paid us. The wonder is not that we had difficulty in paying, but that we paid at all. And yet since the war began we have paid or arranged to pay \$180,000,000, and in the calendar year to date more than \$300,000,000—a store of gold exceeding the entire holdings of the Bank of England. No other nation in the world would have done it; no other could have done it.

For energy displayed and real service in the cause of safety and relief in the face of portentous difficulties, our bankers in this emergency achieved their greatest success. Yet this was but one of their troubles. Without precedents to guide them, with the new Bank Act not yet in practical operation, they saw ordinary standards of value disappear in loans aggregating \$2,000,000,000; they were confronted with widely fluctuating prices of raw materials, famine in many lines of manufacturing essentials such as wool, dye-stuffs and ferro manganese; an utter breakdown in the movement of cotton; cancellations of enormous amounts of projected extensions and shutting down of factories.

Across the water they saw the Bank of England's official rate of discount advanced from 3% to 10%, with a run on that institution which resulted in a loss in gold of \$52,500,000 in the first week of the disturbance. They saw the Bank's ratio of reserve fall from the extraordinarily low figure of 40% to the paralyzing figure of 14 $\frac{5}{8}$ %. They saw the British Treasury directly issuing its own paper money for the first time in modern history, and a moratorium, never resorted to in modern times. They realized, in a word, that a world given over to destruction was living on expedients, and that the British Empire had come as near as it will ever come to putting up the shutters. In a week Europe's prosperity was turned into ruin, its opulence into insolvency.

At any time of crisis, our bankers labor under handicaps to which bankers abroad are not subjected. Other countries are enabled by the agency of their centralized banking system to sustain business and supply credit under all circumstances. They have a giant's strength and they use it like a giant, knowing that the country and the government stand firmly behind them. Thus the British ministry sustained the shock to credit in this emergency by pledging the

credit of the government behind each factor in the trade system, its guarantee of promissory bills alone amounting to \$500,000,000. Postpromissory bills have also been freely guaranteed, and arrangements have been made by which the government and the banks will assume a part of the risk upon Stock Exchange loans. Germany, in a different way, but none the less effectively, has opened credit offices throughout the Empire, and total authorizations on this account approximate \$375,000,000.

In the United States we are quite differently situated. In a crisis there is no centralization of power, no organization of resources. Each bank must, in a large sense, stand on its own feet. Knowing that his individual action can have but trifling effect on a country-wide crisis, the average American banker feels, and with good reason, that the best he can do is to take care of his own institution. Industrially as well as financially there is no cohesion.

Notwithstanding these handicaps our bankers went bravely ahead in the effort to safeguard public confidence, private credit, and American commerce. That the Government at Washington contributed handsomely to these efforts goes without saying. Co-operation between bankers and Government found expression in the creation of an emergency currency under the Aldrich-Vreeland Act, while special legislation by Congress established as a basis for currency warehouse receipts for cotton, tobacco and other commodities. The Treasury created a Bureau of War Risk Insurance, and the banks themselves issued Clearing House certificates which enabled them to meet immediate needs. The telephone and telegraph through many anxious days and nights were used to bring about some measure of concerted action by bankers in all the large cities.

Next to the credit of the government comes that of New York City. The war had scarce begun when maturing city warrants in London and Paris necessitated the provision of a gold loan of \$100,000,000 to the City of New York, \$82,000,000 of which was used to meet the city's foreign borrowings. The best thought of our bankers immediately concentrated on this problem, which at the most critical stage of our difficulties was brought to a successful conclusion. Every bank and trust company in the city, with one single exception, came forward with its share of the subscription. It was a great achievement. That difficulty met, our bankers next turned their attention to the creation of a pool of \$100,000,000

to meet pressing mercantile obligations abroad, and to providing New York's share of the \$135,000,000 pool to relieve the cotton situation.

That there were heavy drains on bank reserves goes without saying, and yet there was the obvious necessity of diminishing those reserves still further by advancing them freely to needy borrowers. The first instinct of every one at a time like this is to hoard, but no man can say that any bank in New York did so, nor did aught else to strengthen itself at the expense of the community. Bankers are dealers in credit; restricting it through hoarding means discredit. The fact that reserves of the Clearing House banks in New York City were \$50,000,000 below their legal requirements throughout the early stages of the war, shows that our bankers, while recognizing the perils involved, were keenly conscious of the fact that their ultimate treasure is not kept for display, but must be employed when necessity demands. I have yet to hear on this score of any just complaint from worthy borrowers.

It is an axiom in the scientific management of gold reserves that they are to be protected, not by forbidding the payment of debts already incurred, but by the prevention of new ones. If credit has its advantages, it has also at times its disadvantages, and to minimize these disadvantages by preventing fresh mercantile liabilities at a time of alarm, calls for great delicacy, judgment and tact, especially when to a formidable foreign drain is added a domestic drain. At such a time everybody wants to borrow at once, and the demand comes just when bankers like it least. If the demand is satisfied reserves are depleted; if it is not satisfied there is alarm and panic. In the emergency through which we have just passed I need hardly assure you that bold and courageous banking has been seen at its best in our financial center. There has been unselfish patriotism, a quick grasp of expedients, and a firm front in the face of danger. With bankruptcy threatening the country's industries, with no sure and certain ground upon which to stand, with conditions infinitely worse than any heretofore encountered, there was no panic. We had, to be sure, closed some of the avenues through which panics find expression. In those that remained open there was no sign of alarm, because with one accord the government, the newspapers, and the private citizen for the first time in our history showed a firm confidence in the men at the helm. The narrow little Wall Street of fiction, the Wall Street of the demagogue, no longer exists. In its place is the real Wall Street, a broad highway from ocean to ocean, meeting the needs and serving the purposes of a continent.

THE STOCK EXCHANGE.

One of the very first things that happened when the war burst was the paralysis of the world's Stock Exchanges. The Bourses at Toronto and Madrid closed July 28th; those at Vienna, Budapest, Brussels, Antwerp, Berlin and Rome on July 29th; St. Petersburg, Montreal and all South American centers July 30th. The Paris Bourse, gorged with huge masses of unsalable Balkan loans and Russian industrials in addition to their own new government loan, was so deluged by sales that a market no longer existed. Accordingly the *Coulisse* and later the Bourse itself was closed, thus throwing all the world's sales of securities on the exchanges of London and New York. The first time in its history the London Exchange, unable to withstand such a torrent of liquidation, closed its doors at 9:00 A. M., July 31st, after the announcement of several failures. The Stock Exchange in New York alone remained open.

When the Governors of our great Exchange gathered together on that eventful morning they were burdened with responsibilities of the utmost gravity. While aware that it would be a splendid achievement to continue business alone among the great security markets of the world, they realized none the less that the over-night accumulation of selling orders from every quarter of the world would impose upon brokers, investors, speculators and bankers a strain that could not be borne. Everybody wanted to sell in New York because there was no other place to sell. Over-night orders revealed a frantic state of mind, and this was especially true of cables. There is no price limit. "Sell at the market," was the word, and utter demoralization the prospect. Europe alone owns \$6,000,000,000 of our securities.* Even if one-fifth or one-tenth of these holdings were unloaded on New York with such suddenness, we could not have absorbed them, nor could we have found a way to pay for them in the circumstances that then prevailed. Literally standing to be shot at, with the certainty of a panic unparalleled in its consequences to American business and industry, the Governors decided, at fifteen minutes before ten, to close the Exchange. Their action calls for nothing but praise; its importance to the whole community is beyond discussion.

The Stock Exchange is not a fair-weather institution. It has survived many panics and it has grown in strength through all our

*This figure has been discounted from one-third to one-half by recent inquiries and analysis.

ful assault on collateral values and a destructive drain on all forms of credit. No group of business men in America suffered more from this action than the members of the exchange; their business came to an end while their expenses, always heavy, continued, all this following a long period of dullness and diminished profits in the security markets. Yet they did their duty as good citizens, regardless of the sacrifices involved.

Just as familiarity breeds contempt and indifference, so it sometimes happens that facilities and conveniences with which we are at most familiar in our great avenues of trade are not appreciated until they are interrupted or lost. Those who without study of the Stock Exchange have come to speak of it as a gambling arena cannot fail to have been impressed with the fact that something more than a gambling place disappeared when its doors were closed. What actually disappeared was the standard American index of of trade and credit; what was closed was a great market place whose primary function had been the distribution of American securities, which make possible American enterprise. We found it inconvenient, to be sure, to have our securities poured back upon us by foreigners, but that fact must not obscure the greater consideration that it was through these same Stock Exchange facilities that foreign capital was enabled to invest in those securities.

Persons who had never before understood the primary importance of the Stock Exchange were quick to realize that a frozen credit market had resulted from its closing. Banks, courts, and legislatures had long accustomed themselves to a free and unrestricted market for securities as the one test of values. When the Stock Exchange closed its doors there was no longer a guide upon which to base values that had heretofore appeared in loans secured by collateral, and this introduced into our perplexities another difficulty. Here again the action of the Wall Street banks calls for the highest praise. With the market closed for an indefinite period, these banks were forced to carry an immense burden of loans on Stock Exchange collateral ordinarily fluid beyond all other forms of collateral, but now frozen solid. All their secondary reserves became, as it were, unmarketable investments, and "intrinsic values"—whatever that may mean—came by force of circumstances to take the place of market values. It was a state of affairs quite beyond precedent, but the banks faced it as they faced all their other difficulties. So far as I am aware, not a single loan was pressed for payment, and where collateral seemed to demand re-enforcement, the request was

couched in terms of suggestion, quite without peremptory demand, while rates of interest charged on these loans were gradually reduced.

Meantime, with the same courage and promptness which led to the closing of the Exchange, its members have so strengthened their bank loans and so reduced them that no difficulty, I fancy, need be apprehended on that score. They have voluntarily accomplished the American vicissitudes. Its Governors decided to close, not to protect its members, but to protect the American public from a fright-liquidation of more than \$100,000,000 of unfilled contracts without adding to their borrowings at the banks, and they have cleared the situation of one of its greatest dangers by maintaining, as the official minimum, the level of prices recorded on their last day of business. They have kept in close working contact at all times with the banks, the authorities at Washington, and the Stock Exchange in London—all this with a view to aiding the restoration of confidence and credit. Through the various committees organized for the purpose more than \$100,000,000 bonds have changed hands, and more than 250,000 shares of stock. Indeed, it might be said that the Exchange has not actually closed its doors at any time. At least it has provided a means for necessitous selling to some extent, and for investment purchases at a fixed level of prices.

Because of the progress that has been made, a natural demand has arisen that the Exchange reopen. Now, in so far as the Stock Exchange and its members are concerned, there is no reason why business should not be resumed. They have cleared up their balances and strengthened their loans to an extent which has put them in readiness. But the same reason that led them to close has thus far impelled them to remain closed, namely, the greatest good for the greatest number.

The purpose of the Stock Exchange is to facilitate the exchange of securities and thereby assist in the creation of new enterprises. At present there are no new enterprises, and there can be none until credit facilities are restored. To reopen the Stock Exchange until tolerably normal conditions prevail in the credit market would force necessitous selling upon investors. This would result in abnormal prices which are uneconomic, unethical and unjust as a basis of settlement. It was to prevent the enforcement of contracts upon such a basis that moratoria were established throughout the world. The New York Stock Exchange is a part, but only a part, of the financial machine. One part of a machine cannot maintain its functions when all other parts are stilled. Any such attempt would mean that large

numbers of innocent investors, wholly unrelated to the war, would suffer hardships. What has been of vastly greater importance in these opening months of the war has been the resumption of an international exchange not of securities, but of commodities which are needed to maintain human life. This also is a matter of credit, and until such ample credit facilities are restored as will insure a free market for foodstuffs and supplies, the Stock Exchange should not, by a resumption of its activities, hamper or restrict that movement. These are reasons why the Stock Exchange has not reopened.

Another reason lies in the fact that Europe is a large holder of American securities, and to reopen our Stock Exchange prematurely, when all the others are closed, would merely invite a resumption of that concentrated pressure on New York which we brought to an end by closing our doors. Sir George Paish has stated recently that he does not believe London will be a heavy seller of our securities. In making that statement he wished, no doubt, to reassure us, and I hope he has stated the case correctly. France will certainly sell heavily. In any case, Europe will not be paid for those securities in gold, and measures looking to other forms of payment are now under way. It must be borne in mind that where payments are due abroad we must pay them promptly, but where payment is due on this side, as in the case of securities sold here by foreigners, the creditor receives his money here, and the question of when and how to convert it into foreign funds becomes, in a crisis like this, a matter of arrangement between the parties in interest.

Meantime improvement continues in many directions. There are record-breaking exports of foodstuffs and of various supplies of manufactured articles; cotton is slowly beginning to find a market, money is accumulating and the resources of the banks will be greatly augmented by the operation of the new Bank Act. There is a marked reduction in loans and a reviving demand for old and seasoned investments. In the long run, imports and exports will bring about offsets, and trade will go on as before. The British moratorium has already ended; that of France has been modified, and the moratoria of other countries are expiring each week. Affairs in this country are moving in an orderly way toward recovery. The banks in the central cities have restored their legal reserves, and fears of a financial crisis have disappeared. But one serious difficulty remains, hav-

ing a vital bearing on the entire investment situation. I refer to the plight of the railways, which to a large extent affects the banks, the Stock Exchange and the entire credit position.

THE RAILWAY SITUATION.

We are agreed, I am sure, that for the sake of the general welfare of the United States, it is necessary that railway revenues must be at all times sufficient to meet expenses of operation, including liberal wages, adequate repairs, renewals and taxes, and that there must be a fair return to investors, with a safeguard in the shape of marginal surplus. We may have our own opinions as to the selfishness of railway employes, the rapacity of railway creditors, and the mistakes of railway managers, but we are agreed that the railways must earn a living wage. That much conceded, let us see whether our American railway properties, as measured by those of other nations, are themselves of such high standard as to merit this fair compensation for services rendered.

The first thing we discover is that it costs seven-tenths of a cent, on the average, to haul a ton of freight a mile in America, whereas in England it costs 2.33 cents, in France 1.41 cents, and in Germany 1.42 cents. Next we find that the average daily compensation paid to railway employes in the United States is \$2.23,* while in England it is \$1.35, in France 88 cents, and in Germany 81 cents. We find that in the United States, 1,071,086 tons are hauled annually per mile of line, while in France the total is but 496,939, and in Germany 827,400; and that while the average stock and bond debt per mile of railways in the United States is \$60,000, that of England is \$265,000, of France \$137,000, and of Germany \$109,000.† Finally we learn that whereas in 1902 the railways of this country paid \$54,-465,000 in taxes, this amount representing 8.35 per cent of their income, in 1914 they paid \$142,150,000, representing 16.69 per cent of their income, this being a higher tax levy than that paid by any other form of private property in America devoted to a public use.

From these consideration we are enabled to state, first, that our railway service costs less than that of any other country; second, that our railways excel all others in the compensation paid employes; third, that American railways do more work per mile of line than any others; fourth, that they are capitalized on a far lower level

*In 1914 it was \$2.54 per day.

†The latest figures are United States, \$65,861; United Kingdom, \$277,346; France, \$148,625, and Germany, \$116,662.

than any others; and, fifth, that they pay more than a fair share in taxes. If therefore any form of private property is entitled to earn a fair return on its invested capital, our American railways are preëminently in that class. It seems to me we should be proud of them.

While our railroads do more work for less money than any in the world, and while they are better equipped for the economical handling of long-distance freight in large bulk, they are far behind the European standards as to double-track, abolition of grade-crossings, and station facilities for passengers and freight. These things cost money, and even if no new construction takes place, capital requirements for this development work alone, year after year, will be enormous.

Railroads in other countries have spent freely in this direction, which explains the difference between their capitalization and ours. In America the outstanding stock and debt of the railways, as we have seen, averages about \$60,000 to the mile; in England it is \$265,000. The only way we can raise the money to do the necessary work, and so bring our railroads up to the standards demanded, is by the sale of securities, just as they have done in England and elsewhere. But neither the rate of return actually received on the par value of American railroad bonds and stocks today, nor the security which can be offered in future, will make it easy to raise this needed capital.

These were the conclusions of the Hadley Commission of 1911—by all odds the most intelligent commission that has ever considered the railroad problem. Today conditions have changed greatly for the worse. The outstanding issues of American railway securities, about \$20,000,000,000 in all, issued before Government and State regulation became the fashion, claim our first attention. These securities were purchased in good faith by investors at home and abroad; scarcely a single one of our people can escape a share of the burden that must result if their value is to become permanently impaired. The depositor in a savings bank will suffer, because the bank's investments are bottomed on railway securities; the holder of an insurance policy will suffer for the same reason; our colleges and universities, our hospitals and charitable institutions, our trust funds, our endowments, and our army of 4,000,000 private investors, each contributes a link to the chain of universal distress which must result from the plight of the railways. This is not because the underlying first mortgages of the older systems are in

danger of default, but because the property thus mortgaged must inevitably deteriorate from year to year unless new money is constantly put back into it.

It was the understanding, implied if not expressed when these investments were placed in the hands of the public, that they would continue on a paying basis, and that the properties behind them would be maintained at a high state of efficiency. It never occurred to purchasers or sellers that the time would ever come in America when necessary replacements would not be made, or when necessary net revenues would be interfered with. To the extent that these implied promises have not been kept, holders of American railway securities have been betrayed.

Railways are no different from any other form of property devoted to public purposes. The mill, the factory, the steamship, and even the government, has to face the problem of maintaining net income sooner or later, but with this difference: governments may proceed with expenditures of all kinds through taxation, and privately owned industrial enterprises may raise prices or retrench by reducing output; but the railroads must continue to run on schedule time, must maintain wage agreements, must go ahead with the changes and improvements demanded by forty-eight States and the Federal Government, and may not increase their rates although pressed between the millstones of sluggish revenue and diminished credit on the one side, and political hostility and excessive regulation on the other. The mill owner has a diversity of output; if one proves unprofitable he may drop it and turn to others; but the railroad has only one thing to sell—that is, transportation.

In the rate case just argued at Washington it was shown that the return on railway capital employed today is 3.99%; yet renewals of notes of roads enjoying the high credit of the New York Central and the Lake Shore today cost 7%. The greater the fall in net income the higher the rate of interest demanded by lenders of capital. There is no escape from this double-barreled assassination of railway credit. Investors and speculators will not buy railway securities today because they must take risks which never can be accurately forecast at any time, and which are now out of all proportion to the probable gain. Can we wonder at their attitude? No; and there will be no return of normal investment demand while present conditions prevail.

What are these conditions? Stated briefly, last year's gross earnings fell short of those of the preceding year by \$79,479,672.

This is bad enough ; but, notwithstanding the utmost efforts at economy, expenses actually increased in the year by \$31,434,374, which, added to the loss of \$79,479,672 in gross, reduced the net by the prodigious sum of \$110,914,046. Nor is this all. The earnings as I have given them do not include deduction of taxes. Taxes in the fiscal year 1914 exceeded those of 1913 by over \$13,000,000, making a total loss of more than \$124,000,000 for the year ; and all this at a time when large increases in net were imperatively needed.

I am giving you in rough outline a picture of coming disaster. You yourselves can fill in the background and the perspective. You can tell as well as I how much further traffic will be reduced by reason of a diminished purchasing power at home and abroad, and to what extent enhanced pressure is to fall upon the world's depleted supply of capital growing out of the war. You may judge for yourself how impossible it will be for the United States to buy back from Europe even one-fifth or one-tenth of the American railway securities now owned abroad, which securities, wholly apart from the war itself, have fallen to low estate in the estimation of foreign investors.

Significant as these matters are in their application to our railways, they are but details. Overshadowing all else is the fact that \$578,000,000 of American railway bonds are now in default because of the inability of the companies to earn the interest agreed upon ; and that the funded debt, notes, and bills payable maturing during the calendar year 1915 by all companies, amount to the staggering total of \$817,465,970—none of which takes into account the mass of new financing made necessary each year by simple replacements and deterioration. Where is the money to come from ? It will not suffice to say that the situation is one of difficulty ; it is one of the utmost gravity.

Railways are fixtures ; we are so accustomed to them that we have come to regard them as a part of our life, like sunshine and rain. We expect at their hands regularity, promptness, carefulness and safety as to passengers and freight. We look to them to suppress strikes, to build new terminals, bridges and extensions, to abolish grade crossings and to find a way to compass all these ends without complaint. We depend upon them so absolutely that we could not possibly get on without them even for a brief time. Yet we permit the efficiency of these 250,000 miles of improved national highways to be impaired, and the billions of invested capital depreci-

ated, through our failure to insist upon a maintenance of that mainstay of the country's prosperity which is represented by railway credit. Last year alone 42 of the 48 states introduced 1,495 separate bills affecting railways, 99 per cent punitive and restrictive, and 1 per cent constructive and helpful; while continuously since 1910 the Eastern railways have petitioned the Interstate Commerce Commission for a meagre increase in rates, without success.

Railway managers will no longer submit to raids on their properties under the thin veneer of state regulation. Henceforth they will fight back. At last week's election in Missouri, a hot-bed of anti-corporation sentiment, the railroads boldly went before the people under the referendum asking that the Full Crew Law of 1912 be annulled. It took courage thus to beard the lion in a state that has long reeked with anti-corporation influence, and nothing was more unlikely than a victory. But the railroads won in a walk, and they always will win if they fight in the open for a worthy cause with clean hands. The Full Crew Law thus defeated by an awakened public conscience of Missouri, is also one of the ornaments of the statute books of our own State of New York. It does not belong there and it should be stricken off. It is not a Full Crew Law; it is an Extra Crew Law, neither more nor less than a waste of capital designed to placate the labor unions. The more labor receives from the railroads the less it gives. The output in transportation units—that is, passenger miles and ton miles, has actually decreased in ten years despite continuous grants to labor. Labor's machinery and tools have been improved, there has been constantly increasing managerial initiative, wages have been steadily increased, yet the dollar paid railway labor today is actually less productive than it was ten years ago.

So long as the Interstate Commerce Commission concerned itself with public safety and the public right to equal treatment for all, it did its work well. It performed a real public service, for example, when it insisted upon uniform methods of accounting. It was sustained by the sound judgment of public opinion when in 1910 it held that the railways had failed to make out a case for higher rates. But when this commission of seven laymen, political appointees, undertook to assume full jurisdiction over rates on the interstate traffic of 250,000 miles of complex and wholly different systems and neighborhoods, supervising the capital expenditures of the companies and controlling their security issues and equipment, even to statistics of fuel consumption, firing, locomotive tests and car movements, as

revealed by the questions put at last year's hearing, it went too far and attempted too much. No commission on earth could perform the task efficiently. Mr. Brandeis himself could not do it.

If in small affairs the railroads are violating the law every day it is because they have to. How can a railway run its trains from state to state with 48 legislative hoppers grinding out new laws all the time, ranging from 9-foot sheets to ash-pans, and not violate a law here and there? You and I and the citizens of all the states are responsible for this. We put the men in office who make these laws; we who sit by without protest while railway credit—the biggest and most important thing in America next to agriculture—is sand-bagged by the politicians. Credit is a power which may grow, said Bagehot, but which cannot be constructed. Break up the great and firm system of credit under which American railways have made this country rich and prosperous, and you will never see that credit return in your generation.

Mr. Brandeis and his colleagues contend that the conditions arising from the war in themselves make an increase in freight rates at this time too burdensome to be borne; the business of the country, they say, cannot afford to pay it. The answer to this is that very many of the largest shippers in the country are themselves strongly in favor of an increase in rates; but even if that were not the case, is there nothing more to this issue than the interests of shippers? The important thing is not what will happen to shippers, but what will happen to the whole public if railway credit is further impaired, if railway facilities fall behind the needs of the country, and if foreign owners, in disgust at our confiscatory policy, unload their securities on the New York market. Will it not cost the public vastly more to face a disaster to railway credit than to provide the roads with the means to prevent such disaster?

Gentlemen, this war will pass. So also will the problems arising from it; but the business of transportation will remain the weakest point in our armor. It has become the fashion, and a very good fashion it is, to be an optimist and to face the future with confidence. But in facing the future we must also face the facts. The plain truth is that we are confronting a crisis. The time has come to cease flattering ourselves with delusions about prosperity, or exports to South America, or any other source on which we may base the hope of a prosperous millennium. What is the use of painting rosy pictures of our foreign commerce while throttling our domestic commerce? Bankers can meet, and always have met successfully,

the ordinary difficulties that are a part of the Nation's life and growth. They have built up a credit system which, when we consider the difficulties involved, is a monument to their patience and skill; they have created a market for our securities in foreign countries not exceeded by any other nation; they have shown at all times a cordial desire to serve the public good in every quarter of the land. But with all their power, skill and resources they cannot prevent a disaster which will shake the solid bed-rock of the Nation itself, unless we adopt at once a new policy of fair play for the railroads.

What is the remedy? The five per cent increase in freight rates asked by the Eastern roads may be dismissed as negligible. Even if granted in full it will not net the railways in Eastern territory more than \$45,000,000. The needs of these identical properties for re-funding and other imperatively necessary improvements in the coming year are \$150,000,000. I do not minimize the importance of the moral effect that will ensue if the commission establishes the principle of fair play through increased revenue, but the application of that principle will not of itself suffice to restore railway credit. The Eastern roads alone have lost \$100,000,000 in net revenues since their application last year for an increase in rates. If the railway problem is to be solved at all it cannot be solved in this way, and we must therefore look farther.

First, there must be no increase in taxation.

Second, Federal regulations superimposed on state regulation must cease. Constitutionally, Congress has paramount authority over interstate commerce, and by its action can abrogate any previous action of the states which may prove inconsistent therewith.

Third, the railways must be given a Federal charter and placed under the jurisdiction of an authority in which business men, railway men and public-spirited citizens predominate to the exclusion of politicians. This form of administration, in its system and method, might well be modelled on the general plan of the Federal Reserve Act, dividing the railroads into geographical districts, governed by boards.

Failing some such transfer of authority, the railways will be justified in saying to the government, "You have placed our properties in inefficient hands and you have subjected us to vexatious and hazardous difficulties. The states and the government have taken over our properties in fact and are administering them in fact. Under these conditions our credit has become impaired, and we have

no means of conducting the transportation industry to meet the public demand. We therefore ask that you take over our properties in law, and reimburse their owners to the full extent of their value."

Gentlemen, the railways of America are today praying for relief literally on their knees. Without relief they will be on their backs, and when they are on their backs there will be more trouble in this country than you and I care to contemplate. The only relief that will prove effective is relief from the whole disastrous system of dual control, relief from politicians and prosecuting attorneys, and above all else, relief from the tyranny of prejudice.

EFFECT OF THE WAR ON PRICES OF AMERICAN RAILROAD BONDS*

BY LEWIS B. FRANKLIN.

VICE PRESIDENT OF THE GUARANTY TRUST CO., NEW YORK.

I had intended to discuss with you the market for American railroad bonds during the past few years, the difficulties experienced by many of our prominent railroad corporations in making satisfactory sales of long-term issues and the various expedients resorted to, to meet maturing obligations and provide funds for new construction and improvements, and then to consider the outlook for future financing.

Any value that might have existed in such a general consideration of this subject has been destroyed by the outbreak of a war such as civilization has never before experienced.

The normal factors governing the prices of securities are to a large extent rendered ineffective by the present war and the consequent international financial situation, and any discussion of the trend of prices of American railroad securities involves a consideration of the economic effects of the conflict. In the effort to determine what this effect will be, it is natural to refer back to other occurrences of similar nature and endeavor to forecast from them something of the future.

Upon careful analysis we find that no war in history is comparable in its effect upon financial transactions with the present upheaval.

The Balkan wars involved no nation of importance in commerce or finance and the theatre of war was strictly localized. Neither Russia nor Japan was a large factor in international business and their operations were confined to the Far East. The war between Russia and Turkey in 1876-77 was of similar nature. The Boer war was carried on entirely in South Africa and had no large immediate effect on international business relations, while our conflict with Spain scarcely caused a ripple in the waters of finance. During all these conflicts communication between the great capitals of the world remained open and international trade was not disturbed. It must not be understood, however, that these wars did

*Address delivered before the Society of Railway Financial officials at Lenox, Mass., Sept. 16, 1914.

not have their effect on the finances of every civilized country. Such a destruction of capital as was involved in even the least of these conflicts has a deep underlying effect on the finances of the world that may take years to overcome, even though no immediate change is apparent.

Not since 1870 have two nations which might be ranked as among the leaders in commerce and finance been engaged in war, and for this reason it is natural to review the effect of the Franco-Prussian war upon international finance in general and American finance in particular.

War was declared by France on July 15, 1870. Prior to and after the declaration there was a rapid fall in prices of securities on the London Stock Exchange, such American stocks as were listed there sharing in the decline, while in our market there was no great excitement and only a moderate fall. This was followed here by a considerable rise during the progress of hostilities and immediately thereafter. During this period our money market remained undisturbed, except for a seasonal stringency at the end of the year, due to internal causes, while foreign exchange with the leading capitals of Europe continued normal, except with Paris during the siege of that city.

The amount of our securities sold to us by Europe was inconsiderable, and it was not necessary to resort to any extreme expedients, such as the closing of the Stock Exchange.

It may seem strange that any such upheaval involving as it did, some 1,700,000 men engaged in warfare, and costing over \$2,500,000,000, should have such a limited effect on our markets, in comparison with the effect of the present struggle, and yet the reason is not hard to find.

During the calendar year 1869 our total imports were valued at \$463,424,421 and our exports at \$394,731,999, a total foreign commerce of \$858,156,420, while for the year 1913 our imports were \$1,892,168,000 and our exports \$2,638,593,000, making a total of \$4,530,761,000, or an increase of about 500 per cent over 1869. The interchange of credits involved in transactions of such magnitude is enormous, and this interchange has through the disturbance of financial systems been seriously deranged in some cases and entirely stopped in others. With Germany alone our foreign commerce in 1913 amounted to the stupendous total of \$520,647,283, which is now at an absolute standstill, while our commercial relations with other countries are heavily restricted.

In 1870 our country was just emerging from the chaos of the civil war, our currency was depreciated to the extent of over 10% and we had practically no stock of gold in our banks. On June 9, 1870 our national banks reported liabilities subject to reserve of \$406,140,873, against which there was held in reserve specie to the extent of only \$2,912,275, or less than 1 per cent. On June 30, 1914, our national banks reported gold or gold certificates in their reserve of \$626,000,000.

These facts demonstrate that whereas in 1870 we were financially weak and unimportant, we are now among the leaders in international finance. In the Middle Ages the merchant trader sent out his ships with gold in their strong boxes or domestic products in their holds and they returned from their voyages laden with the products of foreign countries. From this primitive method of barter commerce has progressed until the present complex system of international credits has been established, a system far more intricate than that in existence even in 1870, and it is evident that no consideration of the effects of that conflict can be of value at the present time. We have, therefore, in the past no safe guide to point the way to the solution of the problems which have arisen, and will rise, on account of the crisis.

A study of the probable effects of the war leads naturally to a division of these into two classes, namely, those of a temporary or artificial nature and those of a permanent or basic nature.

We have already experienced most of the immediate results. We have seen the system of international credit relations disrupted at the first blow. Moratoria have been generally declared throughout Europe, and payments due us are held up while we, as a natural country, are expected to meet our obligations at maturity. American securities held abroad have been dumped into our markets in such volume that self-preservation compelled us to call a halt by the closing of our principal Stock Exchange and the cessation, by agreement, of the sale of all unlisted securities. Our enormous exports of gold and the consequent strain of our banking facilities have forced us to resort to the expedients of Clearing-House certificates and emergency currency.

Our foreign commerce, except in foodstuffs, is almost at a standstill. The Bureau of Agriculture in its recent report gives promise of one of the largest cotton crops in the history of the country. Normally, we export approximately 60 per cent of this crop, and at the present time, through the shutting down of foreign

mills on account of scarcity of labor, lack of demand for the finished product or inability to finance, hardly a bale of export cotton is moving and extreme measures are being taken to care for the surplus which is sure to exist.

Despite the fact that the stringent measures already adopted have prevented panic and to some extent opened the channels of trade, we have still to face the problem of meeting the wave of foreign liquidation which is likely to break upon us upon the reopening of our markets. It has been estimated that American securities to the extent of from four to seven billion dollars are held in Europe, and while it is evident that a large part of these are not for sale at any price, it is quite certain that the drain on the resources of the belligerent nations will be so tremendous as to necessitate enormous liquidation. Their own securities are due to suffer more than ours and our markets are therefore likely to be the most available. This problem must wait until our international credit and commercial relations have been placed on a more normal footing. We cannot buy securities unless we can sell commodities.

If we are unable to take care of our securities now offered for sale by Europe how can we expect to find a market for the additional securities which corporations are so anxious to sell to provide for maturing obligations and necessary improvements and extensions? The prospect is indeed not a favorable one. There is no market for bonds now and it is hard to say when there will be one and what prices bonds will command when the market opens. In any event, our railroads on the average have now an over-proportion of bonded debt compared with the investment represented by capital stock, and it should be by additional issues of stock that present necessities should be financed. How this can be done under present business conditions and the public prejudice against railroad securities is a difficult problem.

Against such an array of unfavorable factors as the immediate result of war, what have we that may be of benefit? In a few lines of business, increased activity is indeed noted on the expectation of increased exports of goods to neutral countries heretofore supplied by belligerents. But here again we are confronted with the difficulty of financing any such shipments and the lack of neutral ships to act as carriers. In one respect only is there an immediate benefit and that is in the larger demand at increasing prices for our food supplies, and despite the difficulty of transportation and payment, such shipments are being made in quantity.

It is probable that this abnormal demand for foodstuffs will continue long after the war has ceased. The farmer of Europe has been turned into a soldier, and while his place has been taken to some extent by the women and children, it is evident that the output of the agricultural districts will be greatly reduced both this year and next.

In this emergency, our executives, legislators and business men have been co-operating with a single purpose, to solve some of the intricate problems now presented, and I am hopeful that this close relationship may lead to a better understanding on the part of each and be productive of a more liberal attitude on the part of the Government toward our great railroad and industrial corporations.

Having discussed in a very general way the immediate effects of the conflict, let us delve deeper into the situation and see if we can determine the basic factors and the permanent results upon our economic condition.

The first and foremost factor of an unfavorable nature is the enormous destruction of fixed capital which is occurring and the consequent expectation of higher rates for its use, as there will be an enormous demand to make good the ravages of war. Just let us consider for a moment the difference between fixed and liquid capital. To reduce this to the simplest distinction, fixed capital is wealth represented by permanent plant, such as factories, rails, cars, steamers, etc., while liquid capital is wealth represented by cash, bank balances, loans and other readily convertible items.

Much has already been written on the cost of the present war and its effects on money rates and the supply of capital, but the mistake has frequently been made of confounding currency with capital and expenditures with waste. From an economic standpoint, the waste of capital incident to war is not the total expenses of the nations involved, but is made up chiefly of the destruction of productive property, such as merchant ships, factories, houses and harvests and the temporary loss in the productive capacity of the nations engaged through the enlistment of such a large proportion of their producing population and the permanent loss in productive capacity by death and mutilation.

In a recent article Mr. Roger W. Babson points out that the destruction of battleships and fortifications is not in itself a destruction of capital, as such property is not productive.

The destruction of capital in this case took place when the fortifications and battleships were built. It is usual to allude to the tre-

mendous loss which will take place if super-dreadnought, costing upwards of \$10,000,000, is destroyed. The loss has taken place, but not then. The date of the loss from an economic standpoint was the date on which her builders turned her over a completed engine of destruction. She has never produced or helped to produce a single dollar of wealth, she has been a constant drain on the resources of her owner to keep her running and her destruction is a gain rather than a loss to mankind in general. Another loss will occur when she is replaced, but to this I will refer later.

Neither is the feeding and clothing of an army a waste of capital, as these men must be fed and clothed even in times of peace. The enormous loss in capital which is taking place comes from neglected harvest fields, idle factories, deserted mines and wasted towns and villages, and in the killing and maiming of hundreds of thousands of citizens who have heretofore been producers, and many of whom, through wounds and illness, are destined to become charges upon the commonwealth. In the aggregate, this actual consumption of capital is enormous, but we must not be deceived by some of the figures now being published. Prof. Charles Richet, of the University of Paris, in discussing the possibility of a war such as is being carried on today, estimated that it would cost \$50,000,000 a day, but of this amount \$25,050,000 is made up of the items of food, pay to the soldiers and workmen, and the support of helpless poor, none of which can be considered as capital destruction. The item of transportation, amounting to \$6,300,000 per day, should probably be divided as being a partial economic waste, while he estimates an actual expenditure for munitions of war of \$11,000,000 per day, which is an actual waste of capital, in so far as such munitions are being replaced. In all, his estimate shows a capital loss of over \$20,000,000 per day. No attempt, however, to make an exact estimate of either the expenses of the conflict or the amount of the economic waste is of any great value to us, but we may rest assured that the whole world is sure to feel the effects for a long while to come. Capital, which for the past few years has been difficult to obtain, will be in still greater demand to make good the losses of war, and it is reasonable to look forward to a long period of higher interest rates on fixed investments, a small supply of new capital and lower prices for investment securities unless we can discover off-setting factors of a sufficiently favorable nature.

Let us look, then, and see what we have on the other side of the picture. Possibly there may be a ray of sunshine somewhere.

One of the first results of a condition of affairs such as we are now experiencing is increasing economy on the part of practically every class of society.

I believe that the generally prosperous condition of this country during the last twenty years has led to a gradual reduction in the proportionate amount of savings, which has in the last few years contributed to our higher cost of living and our higher cost of capital. It is generally conceded that the maximum of saving does not take place in periods of great prosperity, and an upheaval such as the present crisis is often the signal for a return to a simpler scale of living and an increased proportion of saving. It will not take a very large increase of savings per capita to make a radical increase in the amount of capital available yearly. In this connection it is interesting to note that our people in general are far behind those of other countries in the habit of saving. It has recently been stated that the ten leading nations of Europe boast of 373 savings bank depositors per thousand of population, while in the United States the proportion is only 99 to the thousand. Here is room for improvement. The increase or decrease in the wealth of a person or a nation is the difference between income and expenditure.

I have already referred to increased activity in certain lines of business as one of the immediate results of the war and there are likely to be permanent results of a similar nature.

Efforts are already being made looking to the restoration of our merchant marine to its former place of prominence in the commerce of the world, which, if successful, will result in many millions of dollars per annum formerly paid to foreign carriers remaining in this country. (Is this an economic gain in itself?)

Our imports of drugs, dyes, chemicals, toys, gloves, clothing, etc., from Germany have been stopped and supplies of these articles are diminishing and prices rising. American ingenuity is already at work in an effort to manufacture in this country much that we have heretofore imported. If this effort is crowned with success, our productive capacity will be permanently increased and our trade balance benefited.

Markets heretofore held by belligerents, principally Germany, whose foreign trade is now at a standstill, are now open to our manufacturers, and if our opportunities in this respect are not neglected our export business should be permanently benefited.

The favorable factors just mentioned redound to our benefit as a neutral nation, and although of importance, can scarcely offset the

effect which the general destruction of capital will have on the civilized world and in which we must suffer with the rest. Is there any result of the conflict which may in any way counteract the evil influences upon the general economic condition? I believe there is, but to discover what it is we must consider carefully the underlying causes which led to the outbreak of the war.

It is generally conceded that the massacre of Archduke Francis Ferdinand of Austria and the consequent ultimatum from Austria to Servia was the pretext for the war and not its cause. It has been held by some that Germany's ambition to extend her influence through the Balkans to the Aegean Sea, to control Dutch and Belgian harbors, and to further extend her colonial possessions was at the bottom of the trouble. Russia, of course, has always had a jealous eye on the Balkans, and hope for the ultimate possession of Constantinople and apparently it was the probable increase, of German and Austrian influence in Southeastern Europe in case of the overthrow of Servia that led the Czar into the present struggle. France was bound by treaty obligations to support Russia and her people saw an opportunity of regaining the beloved territory lost in 1870. England and Belgium stepped in upon the violation of the latter's neutrality. With the prospect of an absolute upsetting of the balance of power, self-preservation demanded that Great Britain take a hand in the struggle.

The immediate cause of the general outburst seems to have been the support offered by Germany to Austria in her demands upon Servia, and Russia's protest against this action, but we must look below the surface and see if we can discover a motive for this radical move on the part of the German statesmen.

Germany's appropriation for the year ended April 1, 1913, for the maintenance of her army and navy amounted to the equivalent of \$285,000,000, an increase of approximately \$85,000,000 over 1911. This is equal to about \$4.32 per capita on the entire population. This enormous sum and a still greater amount proposed for the year 1914 could only be met by the imposition of an onerous direct tax amounting in some cases to as much as 1½%, in other words, to one-third of an average income. This rapid increase in military appropriation was apparently forced upon Germany by the action of Russia, who increased her military budget from \$335,555,000 in 1911 to \$463,690,000 in 1913. Both Germany and France have also recently increased the term of compulsory military service.

Such a competition in expenditures and in military service could not continue indefinitely. Germany, in addition to the protests against the heavy taxes, was confronted with an evergrowing wave of Socialism. The Socialist has always been arrayed against war and in favor of peace, and this movement was of sufficient strength to threaten even the established form of monarchical government. Something had to be done to stop or justify the mad competition of military expenditures to quiet the socialistic element, and to re-establish the "divine right of kings." Germany was ready; her enemies not so ready as they would be in a few years. War was the only solution and a pretext was not hard to find. In other words, I believe that Germany's action was inspired by causes internal rather than external.

Granting, if you will, that this hypothesis is correct, what bearing has it upon the subject of capital and interest rates?

There seems to me to be three possible terminations to the struggle:

1. Mediation before complete victory by either side.
2. Complete victory for Germany and Austria.
3. Complete victory for the Allies.

In case the war is settled before a decisive victory, it seems to me that while there may be important adjustments in the map of Europe, no radical changes of an economical nature will result. Europe will continue to be an armed camp, and it is not unlikely that the struggle would be renewed some years later. Military equipment, battleships, forts and guns destroyed in the conflict would have to be replaced and military appropriations would continue on an even heavier scale. In this connection it must be remembered that Europe is even now staggering under a load of national debt approximating, for the five principal nations only, \$20,000,000,000, demanding at $3\frac{1}{2}\%$ \$700,000,000 per annum for interest alone. The world, already suffering under its present load of debt and useless expenditure, and with the ravages of war to be paid would indeed be in a bad way, while the condition of Europe from a financial standpoint would be appalling.

Under such circumstances, what can we expect the effect to be upon our securities and upon the future financing of our great corporations? Europe until recently has been a constant and heavy purchaser of our stocks and bonds and has been of immense assistance in developing the natural resources of the country, but if her burdens are to be increased to the extent that I have outlined, we need look for no more help from that quarter and would indeed be compelled to repurchase many of our securities now held abroad. With

such a prospect before us, we cannot but anticipate higher interest rates for fixed investments, greater difficulty in selling securities and a consequent period of retrenchment.

In case of a complete victory for Germany and Austria, the result is also easy to forecast. Germany has been created, enlarged and solidified by the "blood and iron" policy enunciated by Bismarck in 1863. Her military organization again justified by victory, is it reasonable to suppose that she would agree to abandon the sword which has brought her into power? And if Germany retains her army and navy in undiminished strength, can others afford to adopt a different policy? We think not.

The third possible outcome presents a different aspect. In case of complete victory for the Allies, it seems evident that England will have a predominant position in the making of terms. She wants little or nothing in the way of territory and desires chiefly the prosperity of her people and the peace of Europe. England only a short time before the war is reported to have made, without result, a suggestion to Germany for a mutual reduction of the naval program. This indicates that England, despite her small standing army, has felt the strain of military expenditures even in times of peace, and the attitude of her diplomats prior to the outbreak clearly demonstrated her desire to prevent the conflict. France, with all her warlike history, is a peaceful nation at heart, while Belgium desires only reparation for damages and an effective guaranty of neutrality. Servia and Japan cannot be considered as important factors in the making of terms of peace. Every nation involved has felt the enormous strain of military expenditures and in the event of an ultimate victory for the Allies, is it a wild dream to expect that as the only remedy the practical disarmament of Europe, nay, of the whole world, may be the outcome? Germany, beaten, with its military organization unjustified, would hardly be in a position to protest or even to persuade her own people to rebuild the organization, if such a thing were to be allowed under the terms of settlement.

Russia, with her monarchical government, seems to be the key to the problem, yet it must not be forgotten that whatever his motives, it was from the present Czar, even then disturbed by the growth of military expenditure, that there came in the year 1898 the first tentative proposition for universal disarmament. If this could be accomplished, what would it mean to Europe and to the world?

During the last fiscal year for which figures are available, the estimated expenditures of the principal nations of Europe for mili-

tary purposes amounted to the huge total of \$2,000,000,000. Imagine, if you can, what it would mean if this sum were to be diverted from the support of the destructive forces and used in the development of the natural resources of the world. Such a sum added to the present amount available annually for investment would mean an abundance of capital for industrial development, both here and abroad, lower interest rates and probably lower cost of living. Add to this the transfer of some 4,500,000 men which make up the standing armies of Europe on a peace footing, from a life of economic waste to productive pursuits, and it is not hard to believe that Europe would require very few years to recover from the ravages of war and enter upon a long period of prosperity from which we would be one of the greatest beneficiaries. Under such conditions, capital would accumulate with surprising rapidity, and Europe would soon be a heavy buyer of our securities, and we would witness in the country an era of expansion and prosperity such as we never before experienced. If disarmament can be accomplished, the outlook is indeed bright, but under no other conditions can I feel that there is anything to look forward to except a long period of retrenchment, lack of capital, high interest rates and general business depression in which Europe will be the principal sufferer, but in which America is bound to share.

The United States, as the greatest neutral nation, with nothing at stake, except the progress of humanity, is in a position to exert her strongest influence with her friends on the other side of the water that permanent good may result from this awful catastrophe.

Under such circumstances, is it not the patriotic duty of every American, regardless of his present sympathies, to work unceasingly to the end that public opinion both here and abroad may be so united and strengthened in the resolve for complete disarmament that it can be disregarded by neither Congress, nor Parliament, Czar nor Emperor?

In making these suggestions as to the possible outcome, I do not want to be understood as taking a partisan attitude or violating the injunction of our President as to strict neutrality, in thought, word and deed. It is surely not partisan, but Christian, to hope that the outcome may be such as to relieve the world of its burdens of militarism and usher in an abiding era of peace, prosperity and happiness.

SAFETY FIRST

BY R. C. RICHARDS.

CHAIRMAN CENTRAL SAFETY COMMITTEE, CHICAGO & NORTH
WESTERN RAILWAY CO.

SAFETY BULLETIN No. 13.

Safety First is not a question of dollars and cents; it is a question of saving human life, the most valuable thing in the world, which, when once gone, can never be brought back. It is trying to save men from losing their legs and their arms which never can be put back. It is trying to save the making of widows and orphans, destitution and misery. Neither the officers nor the laws can do it. But the workmen can do it if they try.

The following statement shows the reduction in number of accidents on the Chicago & North Western Railway for four and one-half years ending December 31st, 1914, as compared with four and one-half years on same basis as year ending June 30th, 1910, before the Safety First Committees were organized.

173 fewer employes killed, a decrease of.....	35.3 per cent.
10,671 fewer employes injured, a decrease of.....	27.3 per cent.
961 fewer passengers injured, a decrease of....	22.8 per cent.
210 fewer outsiders killed, a decrease of.....	19.4 per cent.
228 fewer outsiders injured, a decrease of.....	8.2 per cent.
Mileage June 30th, 1910.....	7,953
Mileage December 31st, 1914.....	8,423

The North Western Railway operates in nine states, with a mileage of 8,423 miles; the Safety First work was commenced in May, 1910, and there are now over nine hundred men serving on the Division, Terminal, Shop and Local Safety and Central Safety Committees. The best evidence of the effectiveness of the work done by the men serving on these Safety Committees is shown in the following statement of reduction in accidents for the six months ending December 31st, 1914, as compared with the same six months in 1909, before the Safety First Organization was put into operation.

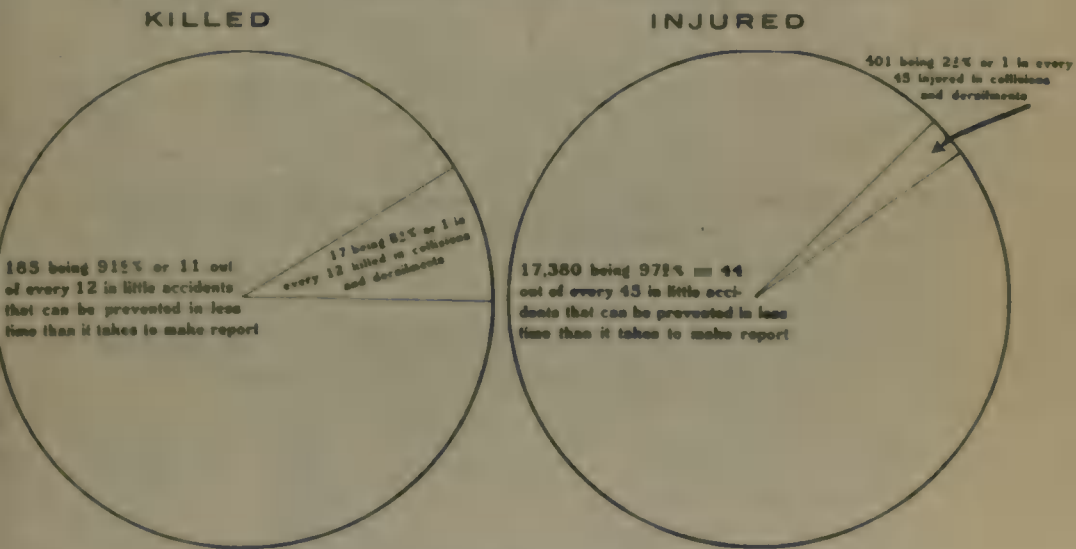
	1909	1914
Employes killed.....	61	24
Employes injured.....	4,546	3,025

In our statistics every case is counted where the injured person loses one day's time or more.

It has been the aim of the Safety First Organization to impress upon the men that it was they and not the stockholders or officers of the road who were being killed and injured; that they are the controlling factor in the work; that every time an employe is killed or injured it not only brings suffering and sorrow to himself and family, but it necessitates the employment of an inexperienced man in his place, thereby increasing the risk of injury to all other employes, and at the same time decreasing the efficiency of the organization.

The issuance of bulletins similar to the following was adopted for the purpose of calling to the attention of the men the importance of eliminating the little accidents which can be prevented in less time than it takes to report them:

Diagram showing employes killed and injured on the Chicago and North Western Railway for the years ending June 30, 1912, 1913 and 1914

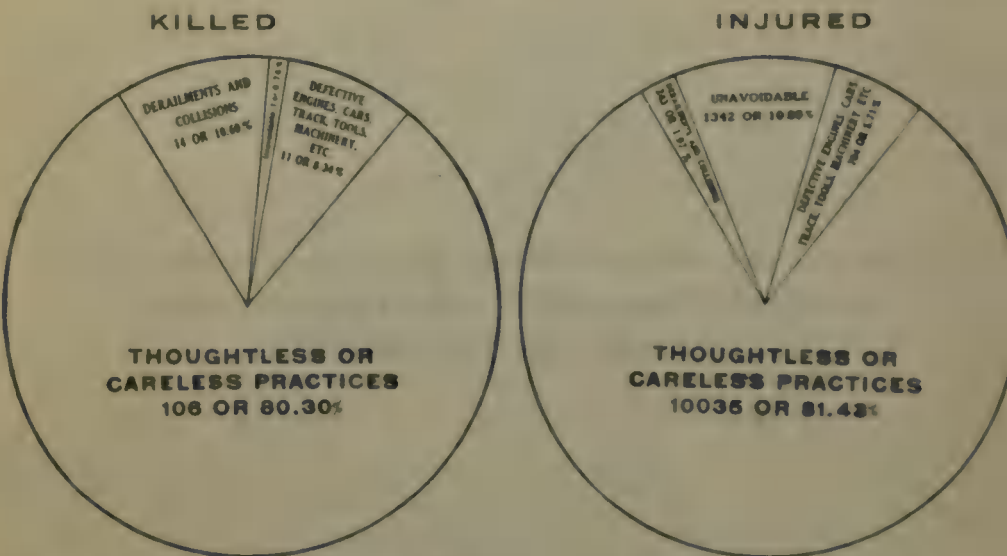


Stop the little accidents and we will wipe out the accident business

In order to show that a large majority of all accidents are preventable and a large part of them are due to carelessness or thoughtless practices and not to defective machines, structures, tracks, engines or cars, the following diagrams were prepared and distributed

to the men, posted on the Safety Bulletin Boards (which have been placed at all points on the railroad where men congregate) and otherwise brought to their attention :

Diagrams showing causes of accidents in which employes were killed and injured while on duty during the two years ending June 30, 1914



Why not stop the thoughtless or careless practices and so reduce the deaths and injuries to North Western men?

In the years 1912, 1913 and 1914, the following recommendations were made by the various Safety First Committees:

	Adopted	Rejected
Division Committees.....	9,582	430
Shop Committees.....	3,084	111
Terminal Committees.....	1,456	32
Local Committees.....	414	26
Central Safety Committee.....	257	29
Total	14,793	628

Because North Western men have become impressed with the importance of complying with the Golden Rule of railroading, "BETTER CAUSE A DELAY THAN CAUSE AN ACCIDENT"; that it is better to be careful than to be crippled; and that

SAFETY FIRST STANDS FOR:

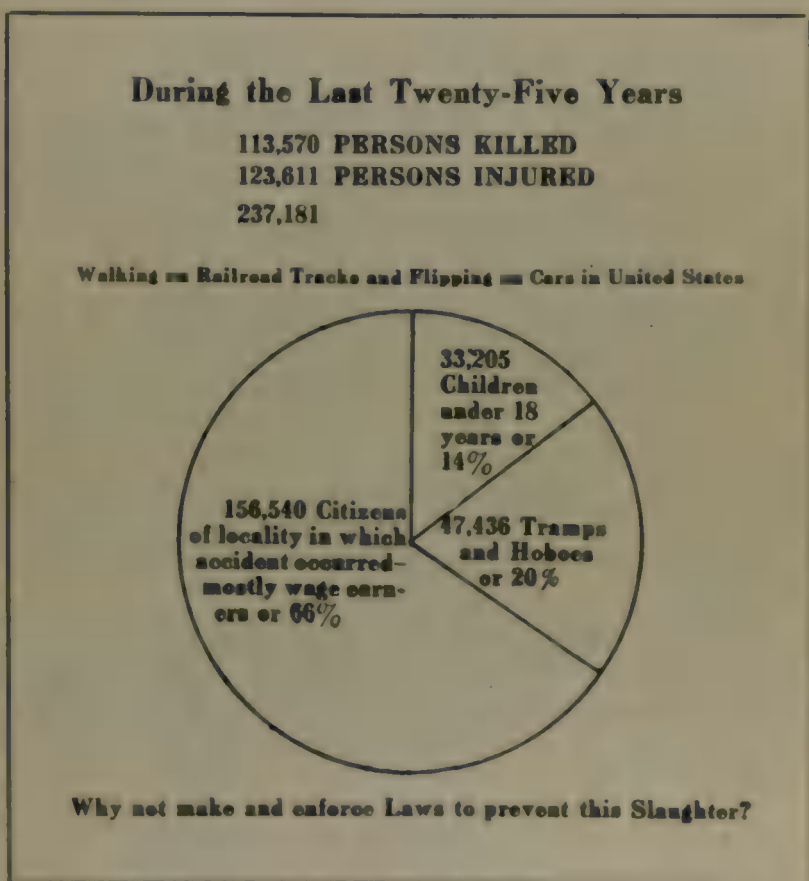
Conservation of human life, Elimination of Chance-takers, who are the makers of cripples, widows and orphans, for safety men as well as things, for greater safety and regularity, in four and one-half years they have accomplished this result—

381 FEWER DEATHS.

11,860 FEWER INJURIES.

Why not boost for Safety First and help wipe out the accidents and make railroading the safest occupation in the world?

The following diagrams will show how much legislation is needed to prevent people walking on railroad tracks and “flipping” on the cars:



Because the North Western men have demonstrated that Safety First stands for—

The conservation of human life, greater safety and regularity, safety men as well as things, increased efficiency and greater har-

mony and co-operation, seventy-six other railroads, with a mileage of 197,503 miles, have adopted the North Western Safety First Organization, or one practically similar to it.

Remember that it takes less time to prevent an accident than it does to report one.

"SAVE YOUR LIVES!" "SAVE YOUR LIVES!"

This is the plea of the Long Island Railroad, which has inaugurated a campaign to get chauffeurs and automobile drivers to be more careful when driving over grade crossings on Long Island.

At prominent points on Long Island, where they cannot fail to be seen by those in automobiles, the railroad is placing huge signs which read:

THIS SIGN MAY SAVE YOUR LIFE TODAY.

All the Precautions in the World Will Not Save the
Lives of Those Who Drive Automobiles Recklessly
Over Railroad Crossings.

When Approaching a Crossing Please Stop, Look and Listen.
We Are Doing Our Part. Won't You Do Yours?

LONG ISLAND RAILROAD.

Some of the signs will be 50 feet long and 10 feet high, while others will be ten feet square. Several of them will be electrically lighted at night.

The Railroad is doing everything in its power to stop accidents at grade crossings, of which there are still 631 on Long Island. Up to date, 305 have been eliminated at a cost of more than \$15,000,000. At the present time, work on the elimination of 32 more crossings is in progress.

REJECTED TRUTHS ABOUT RAILROADS*

BY CHARLES H. MARKHAM,

WRITTEN FOR THE VICKSBURG (MISS.) TIMES-DEMOCRAT; PUBLISHED IN THE VICKSBURG HERALD, JAN. 23, 1915.

Mrs. N. V. Davis, Publisher, Times-Democrat, Vicksburg, Miss.

Dear Madam:—I have just read the article on page 2 of the Times-Democrat of January 4th entitled "The Poor Illinois Central Railroad." My fondest hope has been that one of the blessings which would result from the crisis through which we are now passing would be a better understanding between the people and the railroads. I have felt that, perhaps, we would all have time during these unhappy days, when there is not much else to do, to seek for the truth in the fundamentals which have brought about present conditions, and I have been much gratified that the trend has been that way, not only in the state of Mississippi, but throughout the entire country. I acknowledge a feeling of gratitude toward the newspaper editors of Mississippi who have, in their wise discretion, seen fit to blaze the way in the interest of a new order of things. I believe your newspaper has been the single exception. It must be patent to all that the time has come when a change of some sort is desirable. It must be patent to the people of Mississippi that they cannot expect to attract outside capital to the state if they are unfair and ungenerous toward the large institutions already established there. It must be patent to them that the railroad cannot hope to flourish unless the people upon whom they depend prosper and that, therefore, the people and the railroad are common sufferers. That some of the newspapers of your state have been fair and brave enough to espouse the cause of the railroads is but a natural consequence of the situation which we find ourselves in. The wholesome attitude of the press is by no means alone true of the state of Mississippi, but it is general throughout the country. The leading news-

*That this respectful, candid and reasonable letter was not published in the newspaper to which it was originally addressed, is the reason for its republication in the RAILWAY LIBRARY, illustrating as it does the difficulty the railways have in getting fair treatment from a portion of the press. Happily a great change has come across the face of publicity in this regard in recent years, and the facts about American railways are printed without prejudice in a great majority of American newspapers on their merits the same as other news.—Ed. Library.

papers in every state in the union are pursuing a similar policy. They are doing it, not in behalf of the railroads, but in the interests of the people. Their attitude is well explained by one of the leading weekly newspapers of your own state in a recent editorial, from which I quote:

"The Sentinel has always steadfastly stood for the people against the corporations, wherever an issue has been raised between the two. The record of the paper is well understood and it has never failed to speak out openly on any question where the rights of the people were involved. In conformity with that policy, the Sentinel wants to now voice its vigorous protest against the attitude of a certain class of individuals who seem to think the railroads ought to be regarded as legitimate prey. We say that this protest is made in the interest of the people. By this we mean that the people's interest is being assailed."

I regret to note from an editorial which appeared in *The Times-Democrat* in its issue of the 4th inst., that you are not in accord with the change in thought which is sweeping over Mississippi and other states, but that you seem to see the hidden hand of the railroads in the movement. So far as the lines which I have the honor to represent are concerned, we have nothing to conceal, but, on the other hand, we are willing and anxious to unearth any matter, cause or thing whatsoever affecting the interests of these companies for frank and free public discussion. I believe the railroads have been too reticent in the past; that we have not opened up our thoughts, our hearts, our trials and our tribulations to the extent we should have done. In this respect we are now endeavoring to evolve a change. We have published and distributed some pamphlets in Mississippi and elsewhere. They are before the public for such disposition as it may see fit to make of them. That they have been received warmly is, of course, a matter of personal gratification to me. We invite wholesome criticism. We are grappling for light that will lead us away from the path of the demagogue back to the stratum of prosperity.

If errors creep into any of the literature for which I am responsible, I should be glad to have you call my attention to them, and I take it that you will accord me the same privilege with reference to your utterances. You say there are "none so foolish in Mississippi that will be led to believe, either through the railroad literature, or through the editorials, that have appeared in some of the papers

of the state, that the Illinois Central or any other railroad is made to bear any greater burden than it should bear in the courts of Mississippi."

Our books, which are open to your inspection if you take the trouble to examine them, show at different times during the past two years, more personal injury and kindred law suits against the Yazoo & Mississippi Valley Railroad Company upon the docket of the circuit court of Warren county than were pending at the same periods against the Illinois Central Railroad Company in the progressive states of Iowa and Indiana combined, in which states we operate 885 miles of railway as against 35 miles in Warren county. This system of suing may be beneficial to a handful of lawyers and a few litigants, but is it good for the people of your county as a whole, the men who own the land and pay the taxes, the farmer, the merchant, the manufacturer and the mechanic who are interested in the upbuilding and the development of the community? I put the question to you in all sincerity.

Again you say:

"It might be that in some instances they may be imposed upon, but for every dollar that they lose in this way, it comes back to their coffers with thousands and thousands added by means of the heavy, unequal and unjust freight rates that the people are made to pay."

It costs seven mills, on the average, to haul a ton of freight a mile in America; in England it costs 2.33 cents; in France 1.41 cents and in Germany 1.42 cents. The average daily compensation paid to railway employes in the United States is \$2.23,* while in England it is \$1.35; in France, 88 cents and in Germany 81 cents. I do not think I need say more than that to refute your statement about freight rates. This is a question which has been thoroughly threshed out recently before the Interstate Commerce Commission, which authorized a small increase, resulting in the starting up of many mills and factories and the putting to work of thousands of unemployed men. It is said to have been the most popular decision among all classes of people ever handed down by any court or tribunal.

You say "It would be truly pitiable to hear the whining of the railroad corporation if we could only forget that this same company is the greatest tax dodger that Mississippi has ever known."

*In 1914 the average daily compensation of 1,698,818 railway employes in the United States was \$2.54.—Ed. Library.

I deny that the Illinois Central and the Yazoo & Mississippi Valley Railroad Companies are the "greatest tax dodgers Mississippi has ever known." I admit they are the greatest tax payers the state has ever had within its borders as evidenced by the fact that during the fiscal year ended June 30, 1914, we paid taxes in the state of Mississippi aggregating the large sum of \$823,949.56, or \$530.98 per mile of railway operated, as compared to \$341.45 paid per mile on the Illinois Central in the state of Kentucky and \$317.95 paid per mile in the state of Indiana. I know these figures do not look well in print, but you have made the charge which I do not think should be permitted to go unchallenged and it is therefore incumbent upon me to give the facts.

You have spoken of claims, claim agents and a purpose to inflame the minds of the people and prejudice them against damage suits in general. Our policy is to settle bona fide claims at fair and reasonable figures and we are endeavoring to pursue that course in a thorough and systematic manner. If a person has a meritorious claim again us, he does not have to sue. All we ask is a fair opportunity to settle, but oftentimes, in Mississippi, we are not afforded an opportunity, but are promptly yanked into court. Nobody ever heard of an individual being treated in that manner, yet that is very often meted out to the railroads. As to claim agents, you have two of them located in your city, one working north and the other south of Vicksburg. You know them perhaps better than I do, but I have inquired about them. I find they are both natives of Mississippi, one born and reared at Hernando, and the other from the southern part of the state. I understand they are gentlemen of the highest character. Furthermore, I am informed that they are men of wide acquaintance and deservedly popular, the kind of men that would be a credit to any line of business or any community as citizens.

If we can obtain justice and fairness in our dealings in the courts and elsewhere, we shall be more than satisfied. We are only trying, in our feeble way, to combat the prejudice which has been built up against railroads in the state of Mississippi, the outgrowth of years of systematic effort on the part of those who fight the railroads for personal gain and, as we most earnestly believe, against the public interest. We are merely trying to present our side of the controversy and the moment we undertake to do so, we have it hurled at us that we are trying to "prejudice and inflame the minds" of the

people. Is it right? Are we not entitled to the same patient hearing which the other side have had, uninterruptedly for years? Is it not time that the railroads should be given an inning with a view of letting them try their hand and see what they can do under favorable opportunity? The other side have been in the saddle. What have they accomplished for the good of the people? Look about you and answer the question.

Through agitation and restriction, unwise legislation with its added burdens, increased taxes, unjust litigation and regulation, the railroad edifice of today is facing a most critical situation. In the language of Hon. Warren G. Harding, United States senator-elect from the state of Ohio, "The lawmaking industry is too often worked overtime. It is the only industry in the country that is going 100 per cent. This country needs today less legislative bills pending and more railroad bills of lading."

Let us all place our shoulders to the wheel, bury differences, cast aside suspicions of ulterior motives, and make one good, long pull in the interest of the common weal.

Yours truly,

C. H. MARKHAM.

STATISTICAL CONTROL OF RAILROAD OPERATION*

BY W. M. BAXTER.

GENERAL MANAGER'S STAFF, CANADIAN PACIFIC RAILROAD.

In the early days of railroading, the use of statistics as a means of controlling the operations was very imperfect. Competition was not usually important and the railroads were of short mileage, reaching only a limited territory. The margin of profit was large on rates amounting to only a fraction of the cost of hauling similar goods in wagons or on pack trains. But the profits of the enterprise lured much new capital. Competition became keen, lines were extended, rate wars took place and the solvency of railroads soon became a matter of careful management.

The business of a railroad may be divided into two distinct departments, namely, acquiring traffic and moving traffic, which is similar in industrial enterprises to the selling end and the manufacturing end. A railroad manufactures and sells transportation.

The great difference between the producing of the railroad's commodity and that of a flour mill, or coal mine, from the viewpoint of management, is in the fact that the plant and equipment of the railroad is dissipated or spread over a large stretch of country, while that of the flour mill or coal mine is concentrated, so that all supervision must be delegated, most of the work being done by transportation units, which are continually changing their location, so that they cannot be supervised except in a scattered manner.

An unusually large number of employes must work without supervision and the margin of operating profit is exceedingly small, when compared to the average returns on the investments in manufacturing and farming.

Right here I wish to say that the gross earnings for 1913 of Marshall Field & Company, Chicago, America's largest wholesale dry goods firm, was \$2,000,000 greater than that of the Illinois Central Railroad system, and the interest on the investment was 14 per cent, while that of the Illinois Central was 6 per cent. You can well imagine the furore and condemnation and the howl of "watered stock" that would have been evoked from the public and politicians if this railroad had earned 14 per cent. The Interstate Commerce Commission would more than likely have been in night session.

*Extracts from address before the Canadian Railway Club, Sept., 1914.

As the general manager usually spends the larger portion of his time in inspection and under normal conditions seldom directs the movements of trains, he sees but an infinitesimal volume of the company's business moved. As the scope of his vision is limited, other methods must be resorted to in order to check the operation. The means of accomplishing this is to separate the operation of the road into rigid and definite units and then to compare these units with similar ones on other roads, or with the same road at various periods, or with arbitrary standards chosen as guides, or bench marks.

Controlling a railroad by means of statistics might be defined as the process of determining the unit in each operation and then maintaining these units as nearly rigid as possible, seeing that they are collected, reported accurately and promptly.

The basic operating unit in freight traffic is the ton-mile, which is the product of the ton and the distance. The basic unit in passenger traffic is the passenger mile.

There are six important statistical units deducible from these two fundamentals, which are defined as follows:

1. The average train load, either freight or passengers, is obtained by dividing ton mileage and passenger mileage by train mileage.
2. The average carload, freight and passenger, obtained by dividing ton mileage and passenger mileage by the respective car mileage.
3. The average length of haul for passengers and freight respectively, obtained to dividing passenger mileage and ton mileage by the total number of passengers carried and the total tons moved.
4. Ton miles per engine hour obtained by dividing the engine ton miles by the number of hours the engines are in service.
5. The average revenue per passenger mile and per ton mile, obtained by dividing the freight receipts by ton miles and passenger receipts by passenger miles.
6. The average density of traffic per mile of road, obtained by dividing ton miles and passenger miles by the length of road.

It is unfortunate that this data cannot be given to the executives earlier than five or six weeks after the operations have occurred, owing to the enormous concentration and calculations which must be resorted to in arriving at them on a large system economically.

While they are of final value in determining the general efficiency of the system, it is necessary to have a more immediate check in the form of current records.

Perhaps the most tangible source of daily information is the train sheet, which is received by the train masters, and superintendents, from the despatchers. This sheet records the movements of all trains on the division, showing their consist as to loads and empties and number of cars in the train, and sometimes shows the number of passengers carried on each of the passenger trains, as well as the general movements of traffic, the observance of schedule time, the cause of delays and weather conditions.

By this means of concentrating upon a number of primary officers as much first hand detail information as they can absorb, the foundation of statistical control has been laid.

The results of these primary officers' observations are collected and passed on to their next superior who receives similar reports from many such primary officers and in this way the operations of the road and work performed is reported with diminishing detail, until the chief executive is reached.

The division superintendent is undoubtedly the most important primary officer. The operation of his territory is reported to him daily, and frequently on congested terminals he receives certain information hourly. In addition to this daily data, he has a number of statistical sheets prepared monthly, which show in condensed form, sometimes graphically, the comparative results of a large number of operations on a division, one month against another, one day as against another, and one year as against another.

When these records are graphically presented the sheets are ruled with a number of vertical lines, representing the number of days in a month, or the months in a year, or in other words, progress of time, while a horizontal ruling to scale represents volume or quantity.

In this way the directing officer can readily see for example what has been the average tons per train mile, and the average pounds of coal consumed per 1,000 ton miles for a certain district or territory for a number of months, compared with the same months of the previous year, or if the records have been kept for a number of years fair indication will be had of the season's effect on the traffic.

The important daily returns which a superintendent receives are those showing the number of trains of loaded cars, empty cars,

and total cars received and forwarded in each direction at all of the terminals, also this same information for train movements at important intermediate points. He must know the entire train movement and the tonnage movement, and the failure to perform a given service of these movements as expressed in delays and other causes, must be thoroughly investigated and remedies applied. He is informed about the conditions of each of the yards and terminals on his division and also about outside important terminals, which may affect movements in his territory. He knows the demand for freight and passenger equipment and the class of each required at the various points, as well as the available supply, and the condition and amount of power to move it. All of this information is of a statistical nature.

The officer next superior in rank is the general superintendent. He has received through the superintendents statements showing by divisions the number of engines assigned, total number of through engines shown on the train sheets, the number of through freight engines out of a shop and available for service before a specified time, usually at midnight, the number of through freight engines in shop for repairs and reported as coming out within 24 hours, and those which will not be completed in 24 hours, and also the average mileage made by these engines in service, special engine assignments, such as wayfreights, passenger engines, switch engines, work trains, pickups, etc., together with general remarks on the entire power situation.

He also receives reports on the cars handled at stations, showing the number of cars of merchandise on hand and when unloaded, together with information relating to special car movements. He is also notified concerning traffic exchange at all foreign line connections and if there is a special traffic, originating in his territory, such as coal mining, or some big manufacturing industry, he is advised of the number of cars moved and supplied, and a statement of detentions and their causes, as well as a report on the weather. While these are the principal reports he receives there are numerous special and minor statements furnished or compiled in his office daily, weekly, and monthly, which are beyond the scope of this article.

It is evident that no general superintendent could exercise close watchfulness over the thousands of separate items which these reports cover, and in reality he does not. A man in this position not trained on the property could not make efficient use of them, as the

information gained is not so much absolute as relative. As the great majority of the data he thus receives must be judged comparatively to be of use, the graphic method of recording statistics is perhaps the most practical and is instantly read.

The general superintendent, being familiar with all the conditions of his territory and knowing how it ought to operate, can look for the deviations from the results he is expecting. It may be fairly said that his system of control is by deviations from known standards.

The general manager, however, receives a smaller number of reports dealing only with the principal topics. All of these general considerations and many other local ones, the managing executives have clearly in their minds, but accurate statistical information must be the basis of their judgment in any specific case. They must receive constant advices relative to the current productive power of various localities on the system, the state of the wheat crop, the cotton crop, the lumber market, or seaport traffic, so as to be able to foresee the possible future requirements necessary to handle the business expeditiously. This is again a matter of statistical organization, but it can be made to yield large results in actual operating efficiency.

The traffic department and the operating department must work hand in hand in their investigation of anticipated business, although from different motives.

The traffic manager is interested primarily in car supply and train service. It is his duty to secure the largest possible number of routings of business actually in sight and also devise means for creating business that is not in sight. His business is divided into two main classifications, local traffic and competitive traffic, and he requires daily statistics to show how his local traffic compares with his expectations or with other seasons, and it is of great importance to him to know how his local agents are handling the competitive situation.

Even the local traffic is probably competitive with the traffic of other roads serving other markets, and the traffic manager must gauge the prosperity of his local industries largely in terms of their output and this can be done only by comparative statistical data.

The intricacies of the mechanical department is perhaps most susceptible to statistical control. It deals with plain units in great variety, as for example, pounds of coal consumed per specified service as per train mile or ton mile, or engine miles between stopping or axle miles per hot box. There are really myriads of details in

the mechanical performance of cars and locomotives, which can be standardized by means of statistical records. And deviations from these selected or normal standards will show up in great contrast, thus plainly denoting where investigation and remedy is needed.

The superintendent of motive power and his primary officers are continually engaged in these investigations.

Statistics of earnings and expenses are the ultimate check on all the road's records, and when taken in conjunction with the statement of work performed and shown graphically, present the final picture of the system.

Without knowledge of the work done, however, earnings and expenses are not an adequate means of control. Many roads west of the Mississippi River in the United States operate for 60 per cent of gross earnings or slightly less, while in the East the average is nearer 70 per cent. Thus the operating ratio is an uncertain test of efficiency. The high rates in the newly settled parts of the country make relatively easy a showing which the best operation in the world could not accomplish in a territory of intense competition of long duration, where the struggle for business has reduced the margin of profit of the railroad to a minimum.

THE EXPRESS*

BY R. GORELL BARNES.

I.

When a stillness reigns in the country lanes
And the wayside station's bare,
Stirs a faint, far hum that seems to come
From the spirits of the air;
And the long rails thrill with a murmur till
There's a bursting shell of sound,
A clattering roar, like the rumble of war,
And a trembling of the ground—
A scudding blast has come and passed
With a shriek as of tortured souls,
And along the track is the echoing back
That slowly to silence rolls.

It is I the proud, the strong,
I who sway the lives of men,
Beating out my deathless song
As I speed through field and glen.

II.

I romp with the dawn and startle the fawn
From his couch in the moorland glade
And merrily shake the cattle awake
As they dream in the moontide shade:
I am plodding on when the sunlight's gone
And mortals homeward creep,
And I hammer my tune in the light of the moon
When the world is locked in sleep.
I cleave the night with my gleams of light
And my heart's glow bursting forth,
And behind me I throw in a glittering bow
The diadems of my wrath.

Swift as anger, swift as evil,
I am as a breaking flood;
Restless, tireless and immortal,
Mighty as the power of good.

*From *Love Triumphant and other Poems*—Longmans, Green & Co., 1913.

III.

I chime the hare-bell as I scud through the dell,
And I am the first to spy
In the spring of the year where the snowdrops peer
And the primrose-clusters lie.
There's nothing can be that is hid from me,
For I glance into cottage and field
And nature's design is mine, is mine
And her mystery all revealed :
And I love to play in my boisterous way
With the dress her fancy weaves,
As I rattle along with a dancing throng
Through the home of the autumn leaves.
But little I care for her winsome air
And her anger breaks in vain,
For the snowdrifts I fight with a Titan's delight
And the blustering gales disdain
And defiantly dash through the batter and splash
Of the wayward moods of rain.

O'er the hill, along the plain,
Through the forest speeding,
On the prairie's stretching miles
With fierce hunger feeding,
I am where the bison was,
All the earth exploring
Through the gorge and to the heart
Of the mountain boring,
'Cross the river, by the sea
Onward rushing, roaring.

IV.

I join the hands of distant lands,
With my sister of the sea,
For I grapple with space as I onward race
And fling it away from me.
A mortal pack do I bear on my back
And I roll with the wheels of fate,
For asunder I tear the arms of despair
And I stay not for love nor hate.
I hurl a life far on my rollicking car
As the breezes toss a feather ;
And I fill the great net that Labor has set
And huddle the world together.
I fling wide the door to the valley and moor
And unfetter the laughter of men,
And I strew on the coast a great holiday host—
Which I gather to work again.

I am he who parts asunder,
I am he who joins in song,
As I roll my long, low thunder,
Madly, grandly crash along.

V.

I am weighted down with the spoils of the town
And the harvest of the field:
Gaunt Famine shrinks back at my sudden attack
And Plenty stands there revealed.
Though I travel afar as the servant of War,
I am foster-mother of Peace;
I bind the world's charms on her outstretched arms
And bring to her power increase.
In my strength and my pride am I deified
As the emblem of mortal command,
For I spread o'er the world with the banner unfurled
On the march of a mighty band
And lead a great train, like a thought through the brain
To illumine the darkest land.
The chimney tall starts up at my call
And the factory whistle screams,
As from slumber I wake the shores of the lake
And shatter the valley's dreams.
I am clad in the dress of stern usefulness
And I build with a tyrannous rage:
In my pride I roll on over all that is gone
And I reck not of Beauty nor Age.
For I am Progress, I am Power,
I am the spirit of today:
I fell the forest, clear the glade,
I drain the marsh and crowd the earth.
I roll onward, ever on
Down my God-appointed way,
Herald of the breaking morn,
Calling to a nobler birth
All the forces yet unborn
And the greatness still to be.

NEW UNION PASSENGER STATION AT KANSAS CITY

At midnight on October 31, 1914, the third largest passenger station in the United States was thrown open to the public at Kansas City. Eight years of planning, organizing, negotiating, financing and building, with the expenditure of \$55,000,000 are now represented in one of the world's greatest stations, and the vast network of terminal and connecting tracks, to which it is the gate.

The Kansas City Union Station is located a short distance from the center of the city, at 24th street, extending from Broadway to Grand avenue. The location is about two miles southeast of the old Union Station, and about three blocks away from the old Grand avenue Station. The property occupied by station and tracks is cigar shaped, being about 2,900 by 850 feet. It runs approximately east and west, and is bounded by Washington street, Milwaukee avenue, Grand avenue and Twenty-third street, which had been remodeled into a plaza. In addition to this there are new streets made by the Terminal Company.



MAIN ENTRANCE TO STATION

The station itself is of the pull through type, the tracks running straight on. As regards location in respect to the right of way, it combines the head and side station schemes in a unique form, being built like an inverted T, with the stem containing the waiting room, extending out over the station tracks. The general layout of the station and its relation to the tracks can be readily comprehended by a study of the accompanying cuts of the main floor plan and tracks on succeeding pages.

The main building is 510 feet long by 150 feet wide, and it is 126 feet high above the plaza level. The waiting room wing is 410 feet long by 165 feet wide, and 73 feet high above the plaza level. On the west of the main building are the express buildings extending in a continuous stretch for more than 1,000 feet.

The exterior of the building is in the Renaissance style of architecture. The material is Indiana oolitic limestone. The main lobby, which is 100 by 240 feet, and 108 feet high, is finished in gray Tennessee marble. The interior entrances, toilet, rest and waiting rooms are also marble finish. The roof is of cement tile.

The main entrance to the station is on the south side, but there is a carriage entrance at the west end. On entering the grand lobby from the main entrances the traveler passes the ticket office, and in the center are two information booths, so placed that the streams of travel pass by one or the other of them. In the west end of the station are the baggage check counter, the cab stand, parcel room, cigar shop, men's smoking and toilet room, barber shop and



GRAND LOBBY OF KANSAS CITY STATION

bath rooms. In the east end are the restaurant, lunch room, woman's waiting room, rest room, retiring room and toilet room. Along the north side of the grand lobby are the drug store, containing all kinds of travelers' necessities, news stand, and book store and fruit stand. Adjoining the ticket office are the telephone and telegraph booths.

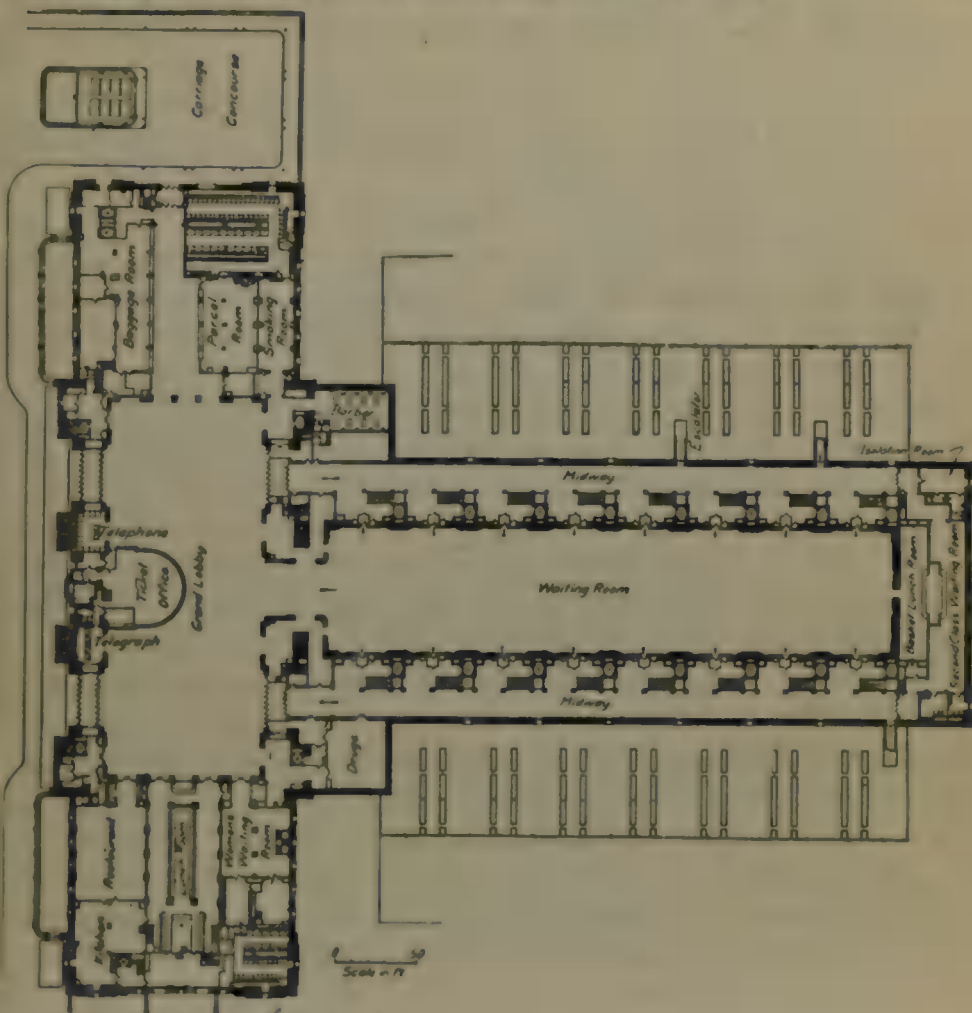
On either side of the main waiting room are passages called "midways," in which are the stairways and elevators leading to the train platforms below. These midways are for the use of incoming passengers and to enable them to reach the grand lobby without passing through the waiting room. The gates through which the passengers go to reach their trains are located along the sides of the waiting room; and the seats which will accommodate 750 people, are arranged so that they can sit near the gates they will use.

The train shed is 1370 feet long, and covers eight platforms, serving 18 tracks, with provision for 10 additional. The sheds are an extended umbrella type connected by steel trusses extending over the track. The roof of the shed is cement tile, like that of the main building, with inserts of prism glass at intervals to transmit light to the platform below.

All city baggage, express and mail is handled in the basement or track level floor, and trains reach this level by inclines from Grand avenue and Broadway. All trucking to and from trains is done in the subway underneath the building and tracks, this level being reached by elevators located in the building and in each end of the platforms. In this way all trucking across tracks at grade is avoided, and city baggage is kept entirely separate from that routed through. Electric storage battery trucks are used for moving the baggage.

The station will occupy a handsome setting when the city completes its work on the adjacent grounds and streets. The station fronts on a plaza of eight acres, which will open into a boulevard, with an 80 feet driveway and 20 feet sidewalk. This boulevard will lead directly into Penn Valley Park, so that where tourists formerly had a most uninviting view of the big bluffs in the city's back yard, they will now emerge from the station into attractive surroundings midway between the business center and the handsome residence district of the South Side of the city.

The style of architecture employed by Jarvis Hunt, the Chicago architect, is modern French, and the exterior is finished in Bedford stone with a granite base. Viewed across the wide Plaza the effect is very imposing. To make room for this plaza over 600,000 yards of earth and stone were hauled away.



MAIN FLOOR PLAN OF DEPOT

The interior style of the station is Louis XVI. The grand lobby has walls of yellow Kasota stone, with architraves and 7 foot bases of brown Tennessee marble. The ceiling is in harmony with the walls, with sunbursts in bronze surrounded by red and blue detail. The floor is pink Kasota and gray Tennessee with a black border.

The general waiting room is finished in buff terra cotta, with ceiling and floor schemes in keeping with the grand lobby.

The smoking and lunch rooms are finished in Vermont marble, Pavanazzo walls and verde antique base. The women's quarters are in Pavanazzo. The restaurant is finished in Skyros pink marble, and all have decorated ceilings, many of the panels being hand painted. The booths are finished in silver wood and walnut. The whole effect gives the visitor an impression of beautifully blended detail.

The station proper was built at a cost of \$6,000,000, but the extensive terminal improvements involved has brought the total expenditures up to \$55,000,000.

The operating company is the Kansas City Terminal Railway, of which the stock is owned by twelve companies: the Atchison, Topeka & Santa Fe, the Chicago & Alton, the Chicago, Burlington & Quincy, the Chicago, Rock Island & Pacific, the Chicago, Milwaukee & St. Paul, the Missouri, Kansas & Texas, the Missouri Pacific, the St. Louis & San Francisco, the Union Pacific, the Wabash, the Chicago Great Western and the Kansas City Southern. This includes all the railroads entering the city, and it was to accommodate all with the greatest convenience and efficiency, and the public as well, that the project was made, in its inception in 1906, to include a new line around the north end of the city, and the location of the passenger station on a new site. The new line diverts a large part of the through freight business from the main passenger lines; and the enterprise included also the reduction of the heavy grade in the old Belt Railway, which now becomes a passenger line, except that it still provides for the freight traffic of the Santa Fe, the Rock Island, and the Chicago, Milwaukee & St. Paul Railway.

The area, 18 acres, covered by the main building and train sheds in the Kansas City Union Passenger Station is exceeded only by that of the Pennsylvania Railroad Station and the New Grand Central Station in New York.

LARGE RAILWAY STATIONS.

The query as to which station ranks as the largest in the United Kingdom, or in the world, is constantly recurring, in one form or another, though, owing to the necessarily varying bases of comparison, it is a question which will probably never be decided authoritatively. However, without criticism of details, or offering further remarks, the following table published by an American journal may be quoted for what it is worth:—

	Total area acres.	Length track, miles.	Number of tracks.	No. of plat- forms.
New Grand Central, New York.....	70.0	31.8	46*	30
Pennsylvania, New York.....	28.0	16.0	21	11
Chicago & North W., Chicago.....	8.0	2.7	16	8
St. Louis Union.....	10.9	5.4	32	16
Boston, South.....	9.2	15.0	32	19
Washington, Union.....	13.0	—	29	13
Cologne.....	5.8	3.4	14	9
London, Waterloo.....	8.75	—	18	—
Dresden	7.9	3.0	14	8
Paris, St. Lazare.....	11.2	3.5	31	14
Frankfort.....	11.0	—	18	9

*Of the total 68 tracks these 46 have platforms.

The Railway News.

SUMMARY OF U. S. RAILROAD SECURITIES HELD ABROAD

STATEMENT COMPILED BY MR. L. F. LOREE, PRESIDENT DELAWARE
AND HUDSON COMPANY, BETWEEN OCTOBER, 1914 AND APRIL, 1915.

DESCRIPTION	RAILROAD SECURITIES HELD ABROAD
Preferred Stock, First.....	\$ 161,281,000
Preferred Stock, Second.....	100,000
Common Stock	633,802,000
Notes	61,376,000
Debenture Bonds	204,005,000
Collateral Trust Bonds.....	227,610,000
Mortgage Bonds	1,269,057,000*
Equipment Bonds (includes Equipment Trust Cer- tificates)	17,364,000
Car Trusts	808,000
Receivers' Certificates	998,000
	<hr/>
Total	\$2,576,401,000
No. of roads requested to furnish information.....	145
No. of roads reported as having securities abroad.....	100
No. of roads reported as <i>not</i> having securities abroad.....	36
	<hr/> 136
No. of roads from whom reports have not been received..	9

* This amount includes \$1,356,000 of Mortgage Bonds of the Colorado Midland Railway Company, that Company stating that they only had record of 60 per cent. of the total of such bonds issued, and this \$1,356,000 is based upon 60 per cent. of the total of such bonds issued.

FIVE PER CENT. FREIGHT RATE CASE

From the Annual Report of the Philadelphia Board of Trade for the year ending February 1, 1915.

The Board, after hearing the report of its Committee on Inland Transportation, presented at the meeting held October 19, 1914, adopted the following:—

Resolved, That the Philadelphia Board of Trade endorses the appeal of railroads in Official Classification Territory for a rehearing in the so-called 5 per cent. rate case, and commends the line of reasoning covered by Commissioners McChord and Daniels in their dissenting opinions handed down in this case on July 29, 1914.

That the members may fully understand the action of the Board the following is quoted from the report leading up to it:—

On August 1st last the Interstate Commerce Commission finally published its long expected decision in this highly important case, inquiry in which was commenced June 21, 1913, after appeal by 35 railroad systems, comprising 112 railroads, serving Official Classification Territory.

Official Classification Territory is bounded by the Atlantic Ocean on the east, to the Mississippi River on the west, and north of the Ohio River to the Great Lakes.

This territory is again subdivided into Central Freight Territory, covering the States of Ohio, Indiana and Illinois; Trunk Line Association Territory, covering the States of New York, Pennsylvania, Delaware, Maryland and Virginia; and New England Freight Association Territory, covering all the New England States.

Under this lengthy and elaborate explanatory decision, so much of Official Classification Territory as is covered by that subdivision known as Central Freight Territory, is given the privilege to make an advance in freight rates equal to 5 per cent., but all the railroads covering east of a line drawn from Buffalo south through Pittsburg down to the Ohio River are refused any advance, but are given much advice as to the manner in which they should operate their roads, are rebuked for not proposing an increase in passenger rates, and are promised that the subjects of switching, lighterage, storage, spotting, ferry and trap car services will be determined at a later date.

Dissenting opinions by Commissioners McChord and Daniels were also handed down.

ADMITS INCREASE NEEDED.

That the commission is beginning to see things in the light of reason may be inferred from a paragraph on page 384, where they say that "in view of a tendency towards a diminishing net operating income, as shown by the facts described, we are of the opinion that the net operating income of the railroads in Official Classification Territory, taken as a whole, is smaller than is

demand in the interest of both the general public and the railroads; and it is our duty and our purpose to aid, so far as we legally may, in the solution of the problem as to the course that the carriers may pursue to meet the situation."

Again on page 403 the majority opinion states, "In what has preceded we have found, treating as one road the 35 railway systems in Official Classification Territory that has asked for this so-called 5 per cent. increase in rates that their net operating income is insufficient and should be increased."

Again on page 404, "Carriers in Central Freight Association Territory ought in the public interest to have as much as 5 per cent. increase and possibly more."

* * * * *

PASSENGER FARES

The majority opinion on page 407 expresses the belief that the people in Central Freight Association Territory will accept raising of passenger fares, because the public is demanding better service and accommodation and safety devices, but this belief is in the face of many State demands and requirements for 2 cents per mile fares, and does not appear consistent with existing facts and conditions.

SPECIAL SERVICES.

On pages 408 and 409 are many suggestions as to ways and means for the roads to increase their revenues by charging for all sorts of services rendered to shippers. These suggestions all appear to have been made by the one special attorney employed by the commission, to elaborate before them his especial theories, which through his many writings, speeches and publications have long been before the public, and the employment of this lawyer to confuse the main question before the commission has been severely criticised by the public press. It was the principle covered by these suggestions that caused this Board to file a protest with the commission at the hearing in Washington on March 12, 1914.

CAMPAIGN OF PUBLICITY.

On pages 425 and 426 the majority of the commission devotes lengthy protests to what they call a "Campaign of Publicity," evidencing that their feelings were much hurt by the very considerable public criticism of their extraordinary delay in coming to a decision, and what appeared to the public to be an antagonistic position to the now acknowledged needs of the applicants for increased freight rates.

Surely the Interstate Commerce Commission is a public body and, though having been given very extensive powers, it has not been set up on a pinnacle so high as to be above the reach of public criticism. The public is beginning to see that control of public utilities by Government Commission does not necessarily or always produce efficiency.

NO IMPENDING CRISIS.

Pages 419 to 421 are devoted to a refutation of the warning that a crisis might be impending as to the credit of our great transportation systems, through having to face rapidly increasing costs of operation and maintenance,

added taxation and State and Governmental requirements, with absence of control of revenues, and concludes with the opinion that little danger is impending, that whilst some roads are facing financial difficulties and others already are in the hands of receivers, on the whole most of the roads are prosperous and could not be materially helped by any practical advance in rates, but must be mended by reorganization on a sound financial basis.

CRISIS ARRIVES.

And now what do we see as to this last nut of wisdom? The very day this decision is made public the securities markets of the world are upset by a foreign war, railroad securities in enormous volumes returned from abroad to us, the financial markets of the world closed, and the very crisis as to which warning was given was sprung upon the entire transportation as well as industrial systems of our entire country.

Commissioner McChord, in his dissenting opinion, says: "Viewed from a commercial, geographical or transportation standpoint, and in the light of facts of record, I am convinced that the reasons which impelled the commission to approve certain changes in Central Freight Association rates apply equally to Trunk Line rates, and that the transportation condition in the two territories are not so unlike as to indicate the wisdom of dissimilar treatment of the rates proposed in the entire Official Classification Territory."

Commissioner Daniels, in his dissenting opinion, opens with the statement, "The majority opinion, however, falls far short, in my judgment, of giving to the carriers in that region the relief to which the evidence of record clearly shows they are entitled."

"Unable to raise their rates without the sanction of the commission, the railroads have found that the margin between their receipts and their outgo has progressively narrowed. Despite recent investments of hundreds of millions embodied in extension and improvements, decline has occurred during a period when the carriers have handled an increasingly greater tonnage and carried more passengers than ever before.

"As a necessary outcome of their declining ability to show profit, the attractiveness to investors of railroad securities has correspondingly grown less. In individual instances this reluctance to invest in such securities is traceable in part to careless or dishonest railroad management; but fortunately these instances of improper administration are the exception and not the rule. Offsetting them are demonstrations of exceptional progress in economy and efficiency of operation."

Again, says Commissioner Daniels: "Acting under authority conferred, as well as under resolution of the Senate and House of Representatives, the commission has prosecuted numerous inquiries into the management of various railroads. While these activities from time to time serve a most useful purpose, there is no necessity of merging such an inquiry with the hearing and determination of a proposed rate advance. An investigation into possible methods of conserving the revenues of carriers was combined with the determination of the question as to the propriety of the rate advances sought in the instant case, with the unfortunate result that a decision upon the matter of approving or disapproving the tariffs filed has been quite unnecessarily delayed."

Plainly referring to the theoretical suggestions of the Boston lawyer employed by the commission, Commissioner Daniels says: "While the suggestions offered at the close of the majority report as to methods of conserving and increasing railroad revenues are, many of them, interesting and significant, others are more or less conjectural, and most of them remote in possible effect. This commission is not constituted by law a board of general managers of the railroads of the country, and the assumption of tendering suggestions as to management ought never to delay or postpone the settlement of a plain matter of law and fact involved in an application for advanced rates."

* * * * *

A WARNING.

In his closing paragraph Commissioner Daniels sounds a note of warning, which it is to be hoped will be heard and listened to, not only by the majority of the commission, but by the people and their Representatives, when he says, "A living wage is as necessary for a railroad as for an individual. A carrier without a sufficient return to cover costs and obtain in addition a margin of profit large enough to attract new capital for extensions and improvements cannot permanently render service commensurate with the needs of the public. Eventually it may come about that railroads will be owned and operated by the Government. This is a matter of public policy which it is not the province of this commission to consider. But that such a departure from the present policy of private ownership and corporate operation should be materially hastened by the reluctance of new capital to invest in these properties would seem to be a grave indictment of our present system of regulation and control."

CONCLUSION.

The crux of the situation is this, that the railroad companies have indebtedness maturing up to the end of December, 1915, of about \$500,000,000, and need annually about \$400,000,000 new capital for normal development. Under existing world conditions, all of these moneys must be provided by American capital, for the capital of Europe will for years be required to pay for the war and the upbuilding of European affairs after the war is over.

Now is the opportunity for the Interstate Commerce Commission to offer assurance to investors that reasonable returns on their capital may be earned by the great transportation systems of this country.

Under date of September 10th, in response to the appeal of a committee of the railroads, President Wilson said: "But the emergency is, in fact, extraordinary, and where there is a manifest common interest we ought all of us to speak out in its behalf."

Upon learning of the decision of the Commission the Committee further reported:—

The Interstate Commerce Commission published on December 16th its final decision in the 5 per cent. rate case under appeal, practically reversing its findings of July 29th, this last decision being essentially in accord with the dissenting opinions of Commissioners McChord and Daniels, which were supported by this Board of Trade by resolution adopted October 19th.

The railroads have been granted the 5 per cent. increase in freight rates asked for, except as to coal, coke and certain other bulky and heavy commodities and lake and rail freight, throughout the entire official classification territory, the same as was first accorded to Central Freight Association Territory alone, and it is expected that this will yield an increase of about $2\frac{1}{2}$ to 3 per cent. in gross freight earnings.

By this decision the commission has recognized that the railroads are entitled to a living wage; that their revenues have been inadequate; that they must meet in increased hire of capital; that "this country cannot afford to have poor railroads, insufficiently equipped, unsubstantially built, carelessly operated."

The commission takes occasion to remind the world that the "Government has not undertaken to become the directing mind in railroad management. We are not the managers of the railroads. And no matter what the revenue they may receive there can be no control placed by us upon its expenditures, no improvements directed, no economies enforced."

It would seem to be a paradox that the Government through its commission should have the power to absolutely control the income or revenues of the transportation systems of the country, with no control whatever as to its expenditures or management. Control of revenues essentially means control of the management.

How then is the commission to know as to the reasonableness of rates, particularly in advance of being tested, yet no rate tariff is permitted to be put in practice till this commission passes thereon and grants permission for its enforcement, through its claim of right to pass on the reasonableness of a proposed rate. Shippers are concerned that ample facilities shall be maintained by the railroads for the handling of their trade and commerce, for its extension and enlargement, and to this end it is vital to their interests that the prosperity and credit of the railroads be upheld.

Let us now hope that the help will be more than sentimental and that improvement in all lines of business will be noted.

STATISTICS OF AMERICAN RAILWAYS

FOR THE YEAR ENDING JUNE 30

1914

PREPARED BY

SLASON THOMPSON

DIRECTOR OF THE BUREAU OF RAILWAY NEWS AND STATISTICS

INTRODUCTORY

The effect of ten years adverse regulation on the railways of the United States is shown in seven lines as follows:

	1904	1914
1. Average receipts per passenger mile (cents).....	2.006	1.981
2. Average receipts per freight ton mile (cents)....	0.780	0.728
3. Ratio of operating expenses and taxes to revenue	70.91 %	76.83 %
4. Proportion of wages to revenues.....	41.36 %	45.14 %
5. Ratio of railway mail pay to revenue.....	2.25 %	1.70 %
6. Net capital per mile.....	\$52,099	\$63,094
7. Forty-five varieties of state regulation pulling at cross purposes.		

The net result of these differences may be summed up in six lines, the effect of the seventh being statistically incalculable:

1. Loss by lower average passenger receipts.....	\$ 9,750,000
2. Loss by lower average freight receipts.....	149,760,000
3. Loss by higher operating ratio.....	180,000,000
4. Loss by higher average wages.....	114,000,000
5. Loss by arbitrary reduction mail pay.....	16,700,000
6. Increased return for larger investment at 5 %.....	187,500,000

Not all of these items are cumulative, but Nos. 1, 2, 5 and 6 are, demonstrating that the change of conditions since 1904 caused a loss to the railways in 1914 of at least \$363,000,000, to say nothing of the effect of No. 7, including Excess Crew Laws, etc.

The supporting data for the above statements are all in the archives of the Commission, which has no need to hold further hearings and inquiries before prescribing wholesome remedies.

THE DAWN OF BETTER DAYS.

Happily there is a reverse and brighter side to the railway situation for the year under review.

First among the signs in 1914 that mark the tempering of the popular mind to the transportation industry should be placed President Wilson's reply to the Committee of Railroad Executives that waited upon him on September 9th. Very briefly, that committee had stated its case, which may be summed up in the single paragraph:

"The net operating income of the railroads of the United States for the year ending June 30, 1914, was \$120,000,000 less than for the previous year, or about 15 per cent. The gross earnings for the year were \$44,000,000 less than for 1913; expenses and taxes were \$76,000,000 more."

In the Eastern rate case, where the railways were acknowledged to need more bread, the Interstate Commerce Commission, under the hypnotic influence of Louis D. Brandeis, had given them a stone and several wisps of straw with which to make bricks.

Then came the European war, involving a general dislocation of trade and commerce and involving railway finances in the general distress. They were confronted by \$580,000,000 obligations maturing in 1915 and nothing to show for fresh credit except reduced net income. It was then they appealed to President Wilson, and this was his heartening response:

THE WHITE HOUSE.
WASHINGTON.

September 10, 1914.

Dear Mr. Trumbull:

Since you read it to me yesterday, I have read again the statement you made me on behalf of the committee of railroad presidents whom I had the pleasure of meeting and conferring with at my office. It is a lucid statement of plain truth.

You ask me to call the attention of the country to the imperative need that railway credits be sustained and the railroads helped in every possible way, whether by private co-operative effort or by the action, wherever feasible, of Governmental agencies, and I am glad to do so, because I think the need very real.

I cannot say that I entertain any deep anxiety about the matter, except, of course, the general anxiety caused by the unprecedented situation of the money markets of the world; because the interest of the producer, the shipper, the merchant, the investor, the financier and the whole public in the proper maintenance and complete efficiency of the railways

is too manifest. They are indispensable to our whole economic life, and railway securities are at the very heart of most investments, large and small, public and private, by individuals and by institutions.

I am confident that there will be active and earnest co-operation in this matter, perhaps the one common interest of our whole industrial life. Undoubtedly men, both in and out of official position, will appreciate what is involved and lend their aid very heartily whenever it is possible for them to lend it.

But the emergency is, in fact, extraordinary, and where there is a manifest common interest we ought all of us to speak out in its behalf, and I am glad to join with you in calling attention to it. This is a time for all to stand together in united effort to comprehend every interest and serve and sustain it in every legitimate way.

The laws must speak plainly and effectively against whatever is wrong or against the public interest, and these laws must be observed; for the rest and within the sphere of legitimate enterprise, we must all stand as one to see justice done and all fair assistance rendered, and rendered ungrudgingly.

Cordially and sincerely yours,

WOODROW WILSON.

Mr. Frank Trumbull, Chairman of Committee of Railroad Executives, consisting of Mr. Samuel Rea, Mr. Daniel Willard, Mr. Fairfax Harrison, Mr. E. P. Ripley, Mr. Hale Holden, Mr. A. J. Earling.

Encouraged by these sympathetic words, on September 15th the Eastern carriers applied for a re-opening of their case. This being granted, upon hearing the Commission, on December 16th, with some exceptions as to lake and rail and coal rates, granted the increases asked for.

What the relief will amount to in dollars and cents does not yet appear, but its moral effect has been stimulating and, with anticipations of more substantial benefits, has encouraged the railways to bear their share of the existing depression with more courage and hopefulness.

More important, perhaps, than the actual relief granted, and the assurance of a change of attitude on the part of a majority of the Commission to one of fostering care for the great railway utility the Commission was appointed to regulate, was one paragraph in the dissenting opinion of Commissioner Harlan. Referring to the necessity for quick relief not to be had by the slow process of minor economies of railway operation, he said:

"Relief, however, could be had immediately if the Commission would refrain from a too free use of its power to suspend increases in rates pending investigation. This power is exercised, in my judgment, with unnecessary frequency, in view of the opportunity that shippers have of

testing the reasonableness of increased rates upon formal complaint filed with the Commission; and, in my judgment, the Congress never intended so free a use of it when the power to suspend was granted to us."

If the Commission were to take the Commissioner's words to heart and let a majority of tariffs, to which there is no *prima facie* objection, go into effect without unreasonable delay, the railways would be able to meet changing conditions with foresight as well as fortitude. In one recent case, possibly an extreme one, notice of an advance in coal rates was given in January, 1913; the tariff was suspended repeatedly, both before hearing and pending a decision, and when last heard from had been suspended until February 1, 1915—more than two years after it was filed. As a matter of public policy, in such cases the public utility should not be compelled to wait on the private interest of any shipper, or class of shippers, who have always their opportunity for redress from an unreasonable rate.

SECRETARY BRYAN LENDS A HAND.

Among the many signs of the changed sentiment toward railway affairs pervading the country, none was more significant than the utterance of Secretary of State William Jennings Bryan before the Indianapolis Transportation Club on February 5th last. Having expressed a desire to bring the railroads and the public into a mutual relationship of "honesty and understanding," he went on to say:

"Give railroad bonds stability and I, for one, will be in favor of permitting railroads to establish surpluses just like banks. I will be in favor of a law to permit the railroads to pay dividends sufficient to keep their stock at par, and draw on the surplus to pay the dividends whenever there is a time of financial stringency. This is something that the railroads have never had the audacity to ask for. But the people would be willing to give it to them, if they had the right to ask for it."

While this is little more than the old rule that requires seekers of equity to come into court with clean hands, it is refreshing to the railway applicant for the right to live and serve the public, to hear it enunciated from so influential a quarter.

COMMISSIONER CLEMENTS WARNS THE STATES.

No less significant was the utterance of Commissioner Clements, the veteran of the Commission, in welcoming the National Association of Railway Commissioners to their 26th Annual Convention in Washington. Although a Georgian, and by all his environments

of birth and education a state's rights man, he availed himself of the occasion to utter his adherence to the principle that no state policy should be allowed to interfere with federal authority in railway regulation.

"Briefly speaking," said he, "the purpose of all railway regulation is to secure rates and the application of rules and practices that are just and reasonable and free from undue discrimination. The oft repeated and self-justifying declaration that the carriers are entitled to an opportunity to earn a fair return upon the property or the investment, and that rates must be free from undue discrimination, is of little comfort to either carrier or shipper unless it is incorporated into such rules of action as will bring fruitful results." . . .

(After giving an example of conflicting state and federal rules, the Commissioner continued:)

"My purpose in presenting this illustration, with the questions which it involves, is to call attention to what seems to me to be an imperative necessity for far-reaching, concurrent and practically uniform recognition of the underlying principles which are to be the guide everywhere in arriving at concrete results which will be reasonable and just. It is manifest that in no other way can just purposes of regulation, both state and federal, be accomplished. Divergent and conflicting state policies which become the bases of state fabrics will continue to produce irritating and intolerable conditions of discrimination, for which some remedy will have to be found. I know of no feature of regulation which demands more than does this—frank, thorough and courageous discussion and treatment. It cries aloud for co-operative action."

Truer words were never spoken. But they met little favor with the gathering to which they were addressed. By a common impulse the State Commissioners assembled scented that their craft was in danger and with one accord cried out, "Great is Regulation by the States!" And verily it is great—the greatest stumbling block to the just, fair and efficient regulation of American railways conceivable. Unfortunately it has the right of possession in all but three states of the Union, with the result that the railways are compelled to look 45 different ways for 45 rival brands of regulation, each jealous of the other and all jealous of *federal control, which should be exclusive and paramount.*

Here is a list of some of the regulative activities under state constitutions, laws and commission orders in eleven western states during the past eight years:

Requiring organization of offices in States.

Prohibiting consolidation of corporations.

Denying foreign railroads right of eminent domain in state except under state charter or permission of Commission.

Reductions in passenger fares.

Reducing freight rates.

Requiring construction and maintenance of side tracks for use of shippers and receivers of freight, also connections with other lines.

Increasing powers or duties of State Commission or creating new commissions with unlimited powers.

Requiring electric headlights on locomotives, or headlights of certain candlepower.

Requiring crossings on public highways or at new highways on streets, also wire crossings.

Laws affecting relations with employes.

In regard to right-of-way fences, hog-tight fences, etc.

Creating live stock sanitary boards having power to require railroads to fence right of way.

Fencing right of way on both sides.

Installation of gates and cattle guards.

Requiring shops maintained in the state.

Separate depot facilities and coaches for negroes, and supplies for coaches.

Fixing destination weights on coal as weights for settlement charges.

Creating departments of labor with certain authority over roundhouses and workshops.

Construction of sheds over repair tracks.

Regulating supply of freight and passenger cars and the time loading, unloading, storage and in transit for freight, and other miscellaneous regulations.

Regulating location, maintenance and operation of stations, station facilities, and terminal facilities, and prescribe station standards.

Affecting issuance of stocks and bonds, dividends, etc.

Relative to construction of bridges, ditches, drains, and clearing vegetation from right of way.

Full crew laws.

Requiring names of officers, copies of contracts and certificates, detailed statement of affairs of company, annual reports, etc.

Regulating freight and passenger rates over bridges.

Requiring safety appliances and specified equipment on locomotives and cars and cabooses, and specifying size of cabooses.

Regulating weight and dimensions of hand baggage, and liability thereon in case of loss or damage.

Regulating the operation of trains and service thereon.

Hours of service laws.

Filing contracts, filing, publishing and posting tariffs and rates and furnishing rates.

Reports of all accidents.

Keeping of records, etc.

Weighing coal.

Cost of roadway, structures and equipment.

Railway employes' liability acts.

Orders and regulations affecting freight and passenger rates.

Rules governing reconsigning of freight, also demurrage and storage.
Regulations governing the operation and maintenance of waiting rooms.

Requiring the construction of new depots.

Opening of new stations.

Additional train service and orders regulating the operation of trains.

Construction of viaducts.

Additional or improved terminal tracks or facilities and track connections with other lines.

Requiring telephone and telegraph service established and maintained.

Ordering additional stock pens, stating specifications for same, also additional facilities at stock pens and removal of pens.

Filing of tariffs, classifications, passenger fare schedules, contracts, time cards, etc.

Valuation of lines in state.

Installation and maintenance of interlockers.

Purchase of locomotives and cars.

Concerning penalties imposed on passengers not purchasing tickets.

Governing express rates, rules and regulations for handling.

Inspection trains for Commission and inspection of roadway and structures.

Miscellaneous orders *ad libitum*.

While many of these laws and orders are the legitimate corollaries of government regulation, they should proceed from a common source and not come upon the railroads from 45 Commissions armed with teeth to rend and mangle the fabric of consistent and sane railway regulation.

Every year these state Commissions issue a small library of annual reports touching on every phase of the railway problem. Some idea of this perennial flood of railway regulation may be had from the fact that the reports of state railway commissions in 1913 contained nearly 29,000 pages. Its very mass is its strongest condemnation.

MISSOURI REJECTS THE FULL CREW LAW.

Happily, amid the din and confusion of state regulation the voice of the voters of Missouri was heard on November 5, 1914, calling a halt on the raid on railway revenues contained in the "Full Crew Law" passed by the last legislature. Being submitted in a referendum, after a spirited campaign in which the needless, wasteful and dangerous nature of the requirement was thoroughly canvassed and exposed, the law was rejected by something over 68,000 majority.

Active campaigns are now being pushed for the repeal of similar laws in other states, with fair prospects of success.

RATE REDUCTIONS IN 1914.

For the first time since this Bureau began its analysis of decisions rendered by the Commission, there was a practical balance in those pro and contra the carriers in 1914. The following table distributes these decisions according to the Commissioners rendering them:

Opinions by	Term expires Dec. 31	GENERAL DOCKET		ADVANCE TARIFF DOCKET	
		Dismissing complaints	Reductions or reparation	Permitting advances	Denying advances
Chairman Harlan	1918	9	11	9	7
Com'er Clements	1920	17	7	9	10
" Clark	1919	13	7	7	6
" Meyer	1917	15	16	8	9
" McChord	1915	9	19	10	12
" Daniels	1916	9	8	4	3
" Hall	1921	1	5	2	4
The Commission		38	39	7	4
Total		111	112	56	55
Percentage		49.78	50.22	50.45	49.55

The balance between these decisions would be complete except for the fact that Commissioner Prouty, before resigning to become director of the Physical Valuation of the Railways, wrote one opinion justifying a tariff advance. On the General Docket he wrote one opinion on either side. For this Docket, the record for the past six years stands as follows:

Number of Decisions.

Year	Dismissing complaints	Per cent	Reparations or reductions	Per cent
1909	138	39.7	219	61.3
1910	138	41.1	198	58.9
1911	93	37.4	156	62.6
1912	132	35.2	243	64.8
1913	118	42.8	158	57.2
1914	111	49.8	112	50.2
Total	730	40.2	1,086	59.8

In studying these figures it is well to remember that the column "Permitting Advances" is the only one affording affirmative relief to the railways. The dismissal of complaints merely means the holding of the trenches against attacks, while the granting of reductions and reparation or denying advances mean substantial losses in revenues. Behind these formal decisions the Commission enters

thousands of "Informal Reparation Orders," aggregating tens of thousands of dollars annually. These a prominent official of a shippers' league thinks should not be mentioned, because, forsooth, the carriers find it cheaper to admit claims than to attempt to separate the meritorious from the meretricious in proceedings where as *supra* the chances are 3 to 2 against a favorable decision.

Wage and rate hearings in progress as this report goes to press will exert a very important influence on the railway situation in the immediate future. Should the arbitrators under the Newlands Act give any increase of pay to the Western enginemen and firemen, it would absorb all that the Western roads might expect as the result of their advance rate hearing before the Commission. That these closely related hearings should be proceeding simultaneously before independent jurisdictions illustrates where our system of railway regulation is fatally weak. The authority to deny freight advances should be vested with the authority to deny advances in wages.

In the field at large there appears to be a letting up in the anti-railway activities of legislatures, but state commissions under the leadership of Commissioner Clifford Thorne, attorney for numerous shipping leagues, show no indications of relaxing their 45 varieties of strangling the transportation industry.

INCOME ACCOUNT FOR THE CALENDAR YEAR 1914.

The following series of tables presents the income of the railways of the United States for the calendar year 1914 in comparison with other years, computed from the monthly returns to the Interstate Commerce Commission. These show a decrease in gross revenues of \$192,037,291 for 1914 when compared with 1913, and of \$87,967,364 in net income. Compared with 1912 the decrease in net income amounted to no less than \$132,115,009. The first table gives the gross operating revenues by months for a series of years.

SUMMARY OF GROSS OPERATING REVENUES OF THE RAILWAYS OF
THE UNITED STATES DURING THE CALENDAR YEARS 1907 TO 1914
(OMITTING 1909, 1911), BY MONTHS AND HALF-YEARLY DIVISIONS.

	1907	1908	1910	1912	1913	1914
Average Mileage..	227,000 (000)	231,584 (000)	239,543 (000)	248,008 (000)	251,227 (000)	254,402
January.....	■ 199,000	■ 173,611	■ 211,041	■ 212,318	\$ 251,290	\$234,788,770
February.....	178,300	161,085	202,825	219,831	234,036	210,342,128
March.....	211,700	183,509	238,725	239,864	250,310	251,092,603
April.....	214,800	175,071	225,856	222,202	246,482	238,846,013
May.....	224,800	174,527	235,134	235,267	266,278	240,953,107
June.....	223,000	184,047	237,998	246,788	263,241	252,925,226
Half Year.....	\$1,251,600	\$1,051,853	\$1,351,570	\$1,376,273	\$1,511,638	\$1,428,947,847
July.....	\$ 228,672	\$ 195,245	■ 230,615	■ 255,152	■ 270,074	\$262,871,065
August.....	241,303	206,877	254,005	278,176	283,467	274,213,779
September.....	234,386	219,013	256,647	277,015	287,566	276,777,815
October.....	250,575	233,105	263,464	301,708	301,084	273,915,671
November.....	220,445	211,281	248,559	280,515	271,030	240,053,828
December.....	194,304	205,455	236,835	267,235	256,319	233,360,102
Half Year.....	\$1,369,688	\$1,270,978	\$1,490,123	\$1,659,803	\$1,669,539	\$1,560,192,200
Total.....	\$2,621,288	\$2,322,831	\$2,841,699	\$3,036,076	\$3,181,177	\$2,989,140,107
Decrease from Preceding Year..		\$298,457				
Increase over Preceding Year..			\$234,470	\$218,927	\$ 145,102	\$192,037,291
Revenue per mile of line.....	■ 11,547	\$ 10,034	\$ 11,865	\$ 12,242	\$ 12,660	\$11,789

Note.—Operating revenues 1909 \$2,607,223,000; revenue per mile of line \$11,099.

Operating revenues 1911, \$2,817,149,000; revenue per mile of line \$11,539.

The figures for operating revenues in 1914 are not strictly comparable with those of preceding years because they include under the head of "incidental" items formerly reported separately under "outside operations." This change does not affect the final net income figures.

SUMMARY OF OPERATING EXPENSES OF THE RAILWAYS OF THE UNITED STATES FOR THE CALENDAR YEARS 1907 TO 1914 (OMITTING 1909, 1911), BY MONTHS AND HALF-YEARLY DIVISIONS.

	1907 (000)	1908 (000)	1910 (000)	1912 (000)	1913 (000)	1914	Ratio to Revenues (1914)
January.....	\$134,225	\$132,502	\$153,631	\$ 165,904	\$188,703	\$181,812,329	77.5 ¹
February.....	121,500	123,773	145,849	162,095	174,356	170,712,853	80.6 ⁸
March.....	142,425	128,200	160,402	170,334	185,229	183,315,950	73.0 ¹
April.....	144,990	124,284	159,130	164,015	186,094	178,867,618	74.8 ⁹
May.....	151,740	123,932	163,361	168,242	192,599	182,812,275	75.8 ⁸
June.....	150,525	124,208	160,814	170,283	185,585	180,507,267	71.3 ⁶
Half Year.....	\$845,405	\$756,902	\$943,190	\$1,000,873	\$1,109,567	\$1,078,028,292	75.44
Ratio.....	67.7%	72%	69.78%	72.72%	73.40%		
July.....	\$152,992	\$127,978	\$157,458	172,355	\$189,700	183,966,713	69.98
August.....	156,837	131,557	164,488	178,417	193,721	184,585,197	67.31
September.....	156,631	137,155	165,067	178,278	193,906	183,330,046	66.24
October.....	166,999	144,195	169,852	191,193	202,864	184,714,236	67.43
November.....	154,150	136,809	164,630	186,655	192,420	172,042,000	71.68
December.....	142,631	136,867	166,478	184,526	187,026	171,280,572	73.39
Half Year.....	\$930,242	\$814,563	\$987,979	\$1,09,424	\$1,159,637	\$1,079,918,764	69.92
Ratio.....	68%	64.1%	66.10%	65.76%	69.46%		
Total.....	\$1,775,647	\$1,571,465	\$1,931,172	\$2,092,297	\$2,269,204	\$2,157,947,056	72.19
Ratio.....	67.8%	67.7%	67.98%	68.91%	71.33%		
Decrease from Preceding Year.....		\$204,152				\$112,257,588	
Increase over Preceding Year.....			\$226,881	\$162,448	\$176,908		
Expenses per Mile	\$7.822	\$6.786	8.068	8.436	\$9.031	\$8.492	

Note.—Operating expenses 1909, \$1,704,290,900; ratio to revenues 65.37%; expenses per mile of line, \$7.255.

Operating expenses 1911, \$1,929,849,000; ratio to revenues 68.49%; expenses per mile of line, \$7.905.

Operating expenses in 1914 are not strictly comparable with those of preceding years because they include charges formerly included separately under "outside operations." This change, which is an improvement in accounting methods, does not affect the final "net income" comparisons.

SUMMARY OF NET OPERATING REVENUES OF THE RAILWAYS OF THE UNITED STATES FOR THE CALENDER YEARS 1907 TO 1914 (OMITTING 1909 AND 1911), BY MONTHS AND HALF-YEARLY DIVISIONS.

	1907 (000)	1908 (000)	1910 (000)	1912 (000)	1913 (000)	1914
January.....	■ 64,775	■ 41,108	■ 57,409	■ 46,414	\$ 65,587	\$ 52,554,617
February.....	56,800	37,311	56,976	57,736	59,679	39,079,124
March.....	69,275	55,309	78,322	60,530	65,081	67,312,535
April.....	69,810	50,787	66,725	58,188	60,388	59,839,815
May.....	73,060	50,594	71,772	67,026	73,679	57,954,698
June.....	72,475	59,838	77,173	76,506	77,656	72,364,476
Half Year.....	\$406,195	\$294,951	\$408,380	\$375,400	\$402,071	\$349,105,265
July.....	75,679	67,267	73,157	82,797	80,373	78,904,352
August.....	84,465	75,319	89,517	99,759	89,747	89,628,582
September.....	77,755	81,858	91,580	98,737	93,660	93,447,769
October.....	83,576	88,909	93,612	110,516	98,219	89,201,435
November.....	66,294	74,472	83,922	93,861	78,610	68,011,828
December.....	51,673	68,587	70,357	82,709	69,293	61,079,530
Half Year.....	\$439,445	\$456,414	\$502,146	\$568,379	\$509,902	\$480,273,496
Twelve Months....	845,640	761,365	910,527	943,779	911,973	829,378,761
Taxes.....	83,156	86,872	109,560	125,763	135,321	141,757,671
Net Operating Income.....	\$762,484	\$664,492	\$900,966	\$818,026	\$776,651	\$687,621,090
Per Mile of Line...	3,359	2,869	3,344	3,299	3,091	2,703
Net Capital Per Mile.....	\$58,298	\$57,201	\$62,657	\$63,535	\$65,861	\$66,000
Rate of Income to Net Capital..	5.76%	5.02%	5.80%	5.19%	4.69%	4.01%

Note.— Net operating income 1909, \$808,173,000; taxes \$94,664,000; net operating income per mile of line \$3,441; net return on capital 5.80%.

Net operating income 1911, \$771,738,000; taxes \$115,562,000; net operating income per mile of line \$3,161; net return on capital 4.94%.

The final figures in the last line of this table expose the present plight of the most efficient railway service in the world in its true nakedness. Here we see that the railways of the United States, whose value is conservatively estimated between \$20,000,000,000 and \$22,000,000,000, with no surplus for improvements and betterments, or contingencies, in 1914 yielded a return of barely 4% on a net capital of less than \$17,000,000,000!

The figures on net capitalization are those of the Interstate Commerce Commission for the fiscal years named, except in 1908 and 1914, for which they are estimated from the Commission's figures.

In the next statement the operating revenues and expenses for the last five calendar years are given in more detail, with the proportion each item bears to gross operating revenues:

STATEMENT OF OPERATING RECEIPTS AND EXPENSES OF THE RAILWAYS OF THE UNITED STATES FOR THE CALENDAR YEARS 1910 TO 1914, WITH RATIOS.

Item	1910	1911	1912	1913	1914
Average Miles Operated.....	(a) 239,975 (000)	(b) 244,134 (000)	(c) 248,008 (000)	(d) 251,277 (000)	(e) 254,402
Operating Revenues from:					
Freight.....	\$1,966,478	\$1,920,685	\$2,111,241	\$2,203,860	\$2,053,879,472
Per Cent of Earnings.....	69.20	68.25	69.54	69.28	68.71
Passengers.....	647,739	661,276	681,203	716,174	670,732,222
Per Cent of Earnings.....	22.79	23.51	22.44	22.51	22.44
Other Transportation Revenue.....	199,181	203,425	211,231	224,939	214,872,266
Per Cent of Earnings.....	7.01	7.23	6.96	7.07	7.19
Non-transportation Revenue.....	28,299	28,834	32,400	36,204	49,656,139
Per Cent of Earnings.....	1.00	1.01	1.06	1.14	1.66
Total Operating Revenues..	\$2,841,699	\$2,815,222	\$3,036,076	\$3,181,177	\$2,989,140,107
Operating Expenses:					
Maintenance of Way and Structure.....	\$383,133	\$367,020	\$398,253	\$438,110	\$398,737,425
Ratio to Revenue.....	13.49	13.04	12.82	13.77	13.34
Maintenance of Equipment...	430,928	433,500	487,883	543,843	523,099,664
Ratio to Revenue.....	15.16	15.40	16.07	17.10	17.50
Traffic Expenses.....	58,643	59,321	62,352	65,531	61,446,001
Ratio to Revenue.....	2.07	2.11	2.05	2.06	2.05
Transportation.....	986,766	995,926	1,079,313	1,142,294	1,086,115,574
Ratio to Revenue.....	34.74	35.39	35.55	35.91	36.34
General Expenses.....	71,634	74,322	73,943	79,425	80,077,507
Ratio to Revenue.....	2.52	2.64	2.42	2.49	2.68
Miscellaneous.....	74	12			8,470,885
Total Operating Expenses...	\$1,931,172	\$1,930,103	\$2,092,297	\$2,269,204	\$2,157,947,056
Ratio.....	67.98	68.58	68.91	71.33	72.19
Profit from Outside Operations	1,686	2,272	1,710	*1,062	
Net Revenues.....	\$912,203	\$886,391	\$945,489	\$910,910	\$829,378,761
Taxes.....	\$109,527	\$115,561	\$125,753	\$135,321	\$141,767,671
Ratio to Gross Earnings.....	3.85	4.10	4.14	4.25	4.74
Net Operating Income.....	\$802,676	\$770,830	\$819,736	\$775,588	\$687,621,090
Ratio to Earnings.....	28.25	27.39	27.00	24.38	23.07
Per Mile of Line.....	\$3.345	\$3.157	\$3.305	\$3.087	\$2.703

(a) At the close of the year 1910 the reports covered 241,364 miles of operated line.

(b) " " " " " 1911 " " " 246,000 " " " "

(c) " " " " " 1912 " " " 249,250 " " " "

(d) " " " " " 1913 " " " 253,376 " " " "

(e) " " " " " 1914 " " " 255,509 " " " "

*Deficit.

Again the student has to be warned that the items for 1914 are not strictly comparable with those for preceding years, but those for net operating income are.

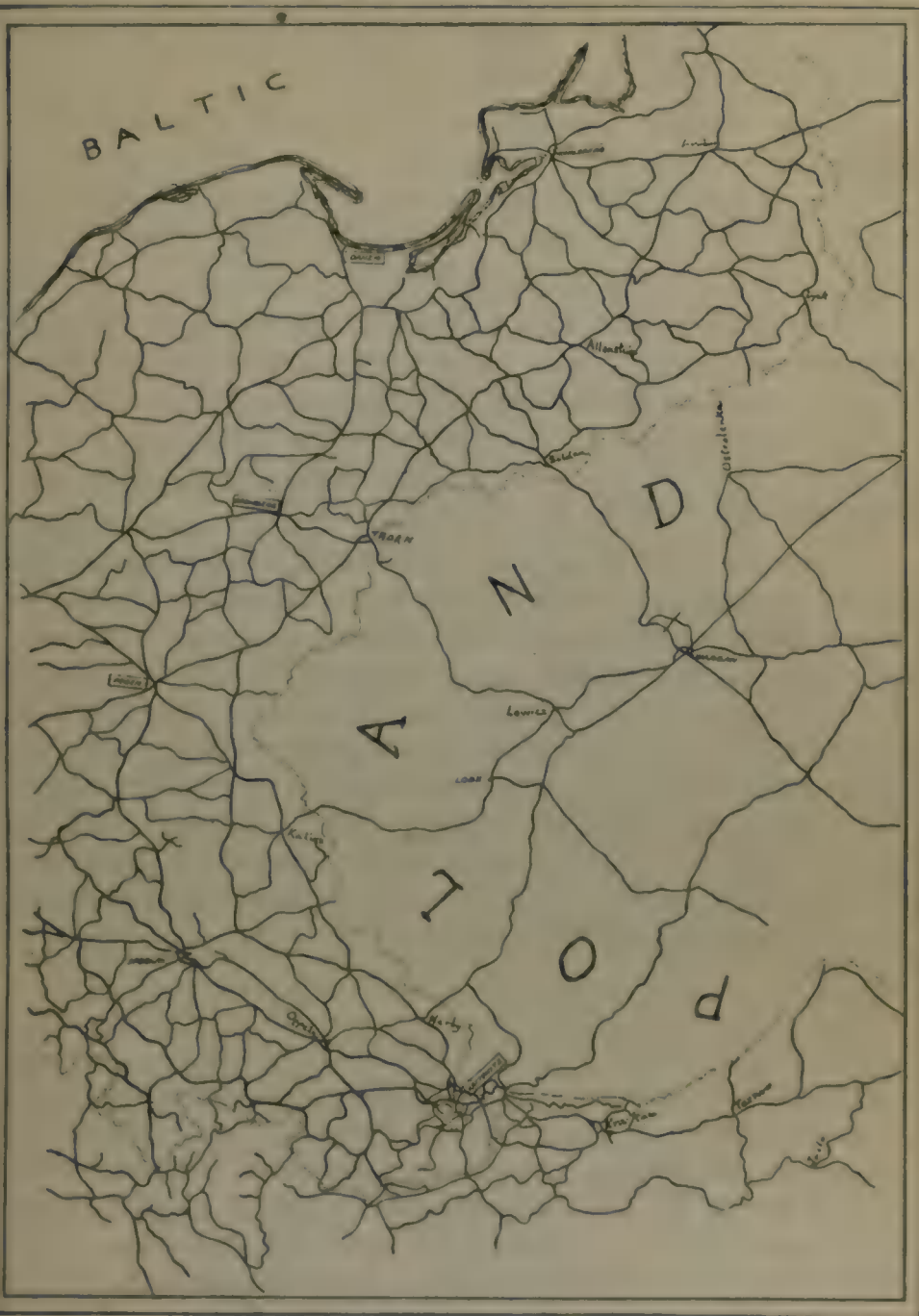
The returns for mail and express required in monthly reports since July 1, 1914, show the growth of the former at the expense of the latter, the percentages to revenues being 1.88 and 2.31 in 1914 against 1.63 and 2.55 in 1913. The proportion of both to gross revenues in the two years was practically the same, indicating that railway receipts from this source have suffered in the common decline.

THE WAR AND EUROPEAN RAILWAYS.

There is little in the income accounts of American railways to indicate that they were peculiarly affected by the European war. In the Southern District the consequent stagnation in the movement of cotton, which prostrated that industry, caused a corresponding loss in railway revenues. But the losses in all railway revenue for the second half of 1914 compared with the corresponding period in 1913 were only slightly greater than those for the first half. Where the war depressed business in some quarters it stimulated it in others and left the railways to wrestle with the same adverse conditions that prevailed previous to August, 1914.

On the continent of Europe and in England the railways became immediately involved as one of the most vital features in the tremendous struggle, so much so that one Commander-in-Chief has called this a "railway war." Some day it will be discussed, as it should be, from this point of view. As in every other feature, the railways of Germany were fully equipped and ready for just what happened. On both frontiers, West and East, the strategic railway had been developed to an extent undreamed of in the military vision of other nations. Observant travelers now recall seeing scores of idle locomotives on side tracks in out of the way regions, but showing no signs of neglect or rust. On 37,665 miles of railway line in 1912 Germany had 28,357 locomotives, or $7\frac{1}{2}$ to every 10 miles, where in the United States with 246,813 miles in the same year we had only 62,262 locomotives, or $2\frac{1}{2}$ per 10 miles of line. Germany had 62,649 passenger cars in 1912 against our 51,490, and German third and fourth class cars had seats for over 2,657,000 soldiers, to say nothing of room for a "standing army." In her freight equipment were cars for every description of armament for military attack or

NETWORK OF RAILWAYS ON THE EASTERN FRONTIER OF PRUSSIA



CAPITAL COST (1912) 308,968 MARKS PER KILOMETER
(\$118,610 PER MILE)

From the Statistik der im Betriebe befindlichen Eisenbahnen Deutschlands 1912

defense. German railways enabled Germany to face her foes and concentrate her forces at either extreme of the empire with greater ease and rapidity than the allies could shift armies fifty miles along any section of their extended lines.

What preparation Germany had made to baffle if not crush Russian assaults on the Polish frontier may be judged from the accompanying map reproduced from the official German railway map of 1912. This also gives some idea of the scarcity of "strategical railways" on the Russian side of the border.

In the appointment of the Director General of the Hamburg American Steamship line as traffic manager of its railways in the present emergency the German government has made a significant admission of the failure of the state system to develop the man for the day. The staff graduated by an arbitrary system was found wanting in the hour of the empire's greatest need.

How the war affected general traffic on German railways may be judged from the following given out by the state officials. Receipts from goods traffic for August, 1914, compared with the corresponding month in 1913, 41.25%; for September, 68.73%; for October, 79.67%; November, 81.41%, and December, 95%. The figures for December, it is believed, are open to "a grain of salt." In the passenger traffic the same comparison yields the following: August, 56.51%; September, 49.59%; October, 61.80%; November, 75.36%, and December, 68.1%. It is calculated that the total decline in German railway receipts caused by the war amounts to \$97,000,000, which is about half the decline in American railway revenue without any war.

GOVERNMENT CONTROL IN ENGLAND.

In England—embracing the United Kingdom in the term—an altogether different situation has developed as a result of the demands of the government on the privately owned railways. Under what is known as the "Regulation of the Forces Act," 1871, Mr. Asquith, as Secretary of State for War, on the declaration of war issued a warrant to the President of the Board of Trade to take possession of the whole of the railways of Great Britain. The purpose was stated to be to insure that the railways, locomotives, rolling stock and staff should be used as a complete unit in the movement of troops, stores and food supplies. But no attempt was made to re-

organize or shift the staff. This remains the same and all orders and instructions are issued through the same channels. Rates, fares and services remain the same, with the all-important exception that all government traffic is handled free and takes precedence of all other traffic.

In compensation for this absolute control of a free hand and service, the government has guaranteed to the companies a net revenue after paying all expenses upon the basis of the net receipts for 1913. The canny government, however, inserted a condition that if the net receipts of the companies for the first half of 1914 should prove smaller than those for the corresponding period in 1913 the former might be adopted as the basis for compensation.

In operation this emergency arrangement has worked with remarkable smoothness and efficiency. The general managers of the leading roads have been constituted an Executive Committee, through which all orders emanating from the government are transmitted, and the great task of accommodating railway service to the government demands and private service is co-ordinated. Through this means the initiative of private intelligence and ambition has been made available in the service of the state. To what purpose may be judged from the fact that one road reports handling 15,000 special military trains since the beginning of the war, another 6,800 and a smaller road 4,400. There has been some curtailment of passenger service, but the returns for 1914 show that the general traffic has been well maintained.

One of the incidents of this quasi-government control of British railways has been the granting of a weekly bonus to all wage-earning employes to meet the increased cost of living. This amounts to about 75 cents to men receiving under \$7.50 a week and 50 cents to men rated at \$7.50 or over a week. This grant will add about \$20,000,000 a year to the expenses of operation, and is to remain in effect during the continuance of the agreement between the government and the companies. Under the law the warrant for this agreement has to be renewed weekly. No arrangement has been made to take care of repairs and renewals, and consequently the expenditures on this account are of a hand-to-mouth nature.

At last accounts over 70,000 British railway employes had enlisted for the war. In Germany all railway employes are enrolled in the military establishments.

THE WAR OF THE GAUGES IN AUSTRALIA.

It is a far cry from the closely co-ordinated railways of Great Britain to the rival systems of the Australian colonies. But out there the demand for military transport has revived the rivalry between the different gauges which have stood in the way of a consolidation of Australian railways. Queensland, which adheres to the 3 ft. 6 in. gauge, recently transported 26 officers and 759 foot soldiers and their baggage in two trains of twenty vehicles weighing 325 tons; and New South Wales, with its 4 ft. 8½ in. gauge required two trains of nineteen vehicles weighing 475 tons to move the same troops. In another instance the narrow gauge railway transported a body of troops consisting of 536 officers and men, 563 horses, 24 road vehicles and all their war impedimenta in five trains weighing 981 tons, against the same number of trains weighing 1,285 tons on the standard gauge.

THE BUREAU'S STATISTICS FOR 1914.

In the following pages the statistics of all the essential features of railway construction, maintenance and operation for the year ending June 30, 1914, as compiled exclusively by this Bureau from annual returns identical with those made to the Interstate Commerce Commission, cover 443 companies operating 245,894 miles of line and 376,033 miles of track. They represent nearly 97% of the mileage and fully 98% of the total traffic of the railways of the United States for that year. The statistics are as accurate and unbiased as careful supervision can make them. The views of the text accompanying them are the writer's own, and are generally confined to mere elucidation.

The section relating to foreign railways has been greatly enlarged and now presents a comprehensive tabulation of the rail statistics for the principal countries of the world. The war has interfered with reports from some countries.

As heretofore, the Interstate Commerce Commission is referred to herein as the "Commission," its annual "Statistics of Railways in the United States" as "Official Statistics," and "the year ending June 30th" is implied before the year named unless otherwise specified.

This publication which, owing to exasperating innovations in the official statistics, has gradually become the sole repository of con-

tinuous data respecting the railways of the United States, is only possible through the annual courtesy of the accounting officials of the reporting roads. When the demands upon their offices for all manner of reports and information are considered, the extent of this courtesy measures the writer's appreciation of it. Acknowledgments are also due to Mr. Francis A. Bonner, associate director of the Bureau, for his work throughout the year, especially in the preparation of the tables of foreign railways.

Chicago, April 5, 1915.

SLASON THOMPSON.

I

MILEAGE OF STEAM RAILWAYS IN 1914

The operated mileage of the railways of the United States on June 30, 1914, was approximately 265,000 miles. Of this total, however, nearly 2,000 miles lie in Canada and 11,111 were operated under trackage rights. This would leave the physical mileage of American railways, so-called, at approximately 252,000 miles. Roundly speaking, the Interstate Commerce Commission classifies the operated mileage as follows:

Class I (Yearly Revenue \$1,000,000 or over).....	228,000 Miles
Class II (" " between \$1,000,000 and \$100,000)	20,000 "
Class III (" " under \$100,000).....	8,500 "
Not filing reports.....	8,500 "
Total	265,000

Reports to this Bureau for the year 1914 cover 245,894 operated miles, of which 1,941 were in Canada and 52 in Mexico. The comprehensive nature of the Bureau's report is evidenced by the following table, comparing its figures with the Commission's latest reports:

	1914 Bureau	1913 Bureau	1913 *Official	1912 Official
Single track.....	245,894	242,177	244,418	249,852
Second track.....	27,644	26,320	26,270	24,952
Third track.....	2,721	2,606	2,589	2,512
Fourth track.....	1,922	1,814	1,964	1,903
Yard track and sidings.....	97,852	94,741	94,338	92,019
Total all tracks.....	376,033	367,658	369,579	371,238

*Class I and II roads only.

Here it will be perceived that so far as auxiliary tracks go the Bureau returns are practically complete. From this it follows that while covering about 97% of the operating mileage of the country, this report deals with fully 98% of its railway traffic.

Of the 245,894 miles of line reported to the Bureau, 11,111 miles were operated under trackage rights, leaving 234,783 as the net physical mileage represented. As the cost of the mileage operated under trackage agreements is represented in rentals paid, the full operated mileage will be used as the divisor in all assignments.

The first summary under this title presents the *operated* mileage reported to this Bureau in 1914 and 1913, classified by states, in comparison with the official figures of mileage owned in 1913, with relation to area and population of the respective territorial divisions:

SUMMARY OF RAILWAY MILEAGE IN THE UNITED STATES, BY STATES, FOR THE YEARS ENDING JUNE 30, 1914 AND 1913, AND ITS RELATION TO AREA AND POPULATION.

State	Bureau's Figures		Commission's Figures		Population Per Mile of Line 1913
	1914 Miles Operated	1913 Miles Operated	1913 Miles Owned	Miles of Line per 100 Sq. Miles	
Alabama.....	5,189	5,102	5,396	10.52	413
Arizona.....	2,096	2,123	2,283	2.01	100
Arkansas.....	4,578	4,419	5,330	10.15	310
California.....	7,288	7,150	8,183	5.26	323
Colorado.....	5,818	5,838	5,710	5.51	154
Connecticut.....	991	1,000	1,001	20.76	1,175
Delaware.....	340	340	335	17.05	619
Florida.....	4,221	3,972	4,908	8.95	167
Georgia.....	6,917	6,786	7,404	12.61	368
Idaho.....	2,646	2,519	2,663	3.20	140
Illinois.....	13,188	13,091	12,012	21.43	489
Indiana.....	7,667	7,679	7,460	20.70	370
Iowa.....	10,138	9,882	9,916	17.84	224
Kansas.....	9,443	9,320	9,257	11.32	190
Kentucky.....	3,777	3,682	3,764	9.34	621
Louisiana.....	4,841	4,662	5,676	12.50	306
Maine.....	2,276	2,289	2,270	7.60	333
Maryland.....	1,350	1,325	1,413	14.21	940
Massachusetts.....	2,116	2,169	2,129	26.49	1,658
Michigan.....	8,254	8,414	8,997	15.65	325
Minnesota.....	9,079	9,011	9,025	11.16	241
Mississippi.....	3,973	4,020	4,485	9.68	414
Missouri.....	8,387	8,349	8,153	11.86	411
Montana.....	4,896	4,457	4,497	3.08	92
Nebraska.....	6,260	6,231	6,142	8.00	200
Nevada.....	2,208	2,140	2,340	2.13	40
New Hampshire.....	1,248	1,223	1,255	13.91	348
New Jersey.....	2,379	2,382	2,309	30.74	1,183
New Mexico.....	2,894	2,820	3,031	2.47	121
New York.....	8,452	8,552	8,511	17.86	1,124
North Carolina.....	4,626	4,291	5,265	10.80	436
North Dakota.....	4,998	4,902	5,032	7.17	130
Ohio.....	9,536	9,470	9,116	22.38	543
Oklahoma.....	6,323	6,769	6,356	9.16	302
Oregon.....	2,432	2,298	2,774	2.90	271
Pennsylvania.....	11,545	11,366	11,507	25.67	702
Rhode Island.....	196	196	204	19.09	2,833
South Carolina.....	3,231	3,128	3,618	11.86	443
South Dakota.....	4,014	3,996	4,206	5.47	152
Tennessee.....	3,729	3,678	3,989	9.57	560
Texas.....	15,359	14,556	15,607	5.95	266
Utah.....	2,007	1,988	2,082	2.53	193
Vermont.....	979	909	1,073	11.76	335
Virginia.....	4,339	4,367	4,603	11.43	480
Washington.....	5,223	5,341	5,289	7.91	252
West Virginia.....	3,129	3,161	3,846	16.01	337
Wisconsin.....	7,389	7,326	7,656	13.86	315
Wyoming.....	1,615	1,480	1,680	1.72	96
Dist. of Columbia.....	51	51	36	60.38	10,000
Canada.....	1,941	1,947			
United States.....	245,572	242,177	249,802	8.40	387

On basis 96,772,206 population for 1913. † Mileage operated in Canada by American roads.

© Omit, Mexico 52 miles and 270 miles not distributed by states.

From the last two columns in this table the reader has no difficulty in ascertaining where there is need of more railways and where construction has anticipated traffic. Wherever the ratio of miles per 100 square miles of territory falls below ten, there is presumptive need for more railways; and wherever population per mile falls below 300, transportation facilities wait on traffic.

The relation of railway mileage to area and population in the United States since 1890 is shown in the next summary:

SUMMARY OF RAILWAY MILEAGE IN THE UNITED STATES, 1914 TO 1890, AND ITS RELATION TO AREA AND POPULATION.

Year Ending June 30	Population (Official) *	Miles of Line Owned†	Miles of Line per 100 Sq. Miles of Territory	Inhabitants per Mile of Line
1914.....	99,027,000	252,059	8.51	391
1913.....	97,337,000	249,030	8.39	389
1912.....	95,656,000	246,816	8.30	386
1911.....	93,983,000	244,180	8.21	383
1910.....	91,972,266	240,438	8.08	382
1909.....	90,556,521	236,868	7.98	382
1908.....	88,938,527	230,494	7.76	378
1907.....	87,320,533	227,671	7.74	370
1906.....	85,702,539	222,575	7.55	373
1905.....	84,084,545	217,018	7.34	378
1904.....	82,466,551	212,577	7.20	379
1903.....	80,848,557	207,187	7.00	384
1902.....	79,230,563	201,673	6.82	388
1901.....	77,612,569	196,075	6.64	391
1900.....	75,994,575	192,941	6.61	393
1899.....	74,318,000	188,277	6.37	395
1898.....	72,947,000	185,371	6.28	394
1897.....	71,592,000	182,920	6.21	390
1896.....	70,254,000	181,154	6.15	384
1895.....	68,934,000	179,176	6.08	382
1894.....	67,632,000	176,603	6.02	379
1893.....	66,349,000	170,332	5.94	377
1892.....	65,086,000	165,691	5.78	380
1891.....	63,844,000	164,603	5.67	380
1890.....	62,947,714	150,272	5.51	384

* For other than census years prior to 1900, and since 1910, the figures of population represent the estimates of the Actuary of the Treasury; between 1900 and 1910 they are estimates of the Bureau of the Census.

† Exclusive of Canadian mileage usually included in "operated" mileage for United States.

Note how closely railway mileage has kept pace with population since this data has been officially compiled. In 1914, for the first time since 1901, has the ratio of inhabitants per mile of line risen above 390. These figures should be compared with similar data for foreign railways on a subsequent page.

In the next summary we have endeavored to restore the territorial grouping of the railways of the United States as established by Prof. Henry C. Adams, when official statistician in 1890, and continued down to 1910. The substitution of three districts for these groupings and dividing them into Classes I, II and III according as gross revenues annually exceeded \$1,000,000; were between that and \$100,000, and less than \$100,000, respectively, was an innovation backwards. Now that Class III has been dropped the United States is left without official statistics of all its railways.

SUMMARY OF RAILWAY MILEAGE ACCORDING TO ASSIGNMENTS FOR OPERATION BY GROUPS, 1914, 1913, AND 1910.

Territory Covered	Mileage on June 30			
	1914 Bureau	1913 Bureau	1910 Official	1913 Official +
Group I.....	7,822	7,849	8,122	} No data
Group II.....	22,604	22,399	23,815	
Group III.....	25,989	26,087	26,172	
Eastern Division.....	56,415	56,335	58,109	62,674
Group IV.....	15,364	14,953	13,966	} No data
Group V.....	31,080	25,794	27,976	
Southern Division.....	46,444	40,747	41,942	46,157
Group VI.....	55,826	49,819	51,830	} No data
Group VII.....	12,730	18,403	13,935	
Group VIII.....	32,775	36,013	33,987	
Group IX.....	17,169	16,811	18,375	
Group X.....	24,535	24,049	22,653	
Western Division.....	143,035	145,095	140,780	135,589
United States.....	245,894	242,177	240,831	244,418

+Classes I and II only.

NOTE: The Bureau divisions for 1914 and 1913 are not comparable because of reassignments in 1914 to bring the groups more in line with the Commission's assignments.

In compiling these figures the Bureau has attempted to adjust the ten territorial groups to the three great divisions into which, for traffic considerations, the Commission has seen fit to divide the country. There can be little question as to the increasing value for comparative purposes of the earlier practice of dividing the United States into smaller and more homogeneous groups. Some day we will have Interstate Commerce Commissioners appointed to represent these groups, who in turn have original jurisdiction delegated to them over questions arising in their respective territories.

NEW RAILWAY CONSTRUCTION IN 1914.

According to the *Railway Age-Gazette*, only 1,531 miles of main line and 595 miles of auxiliary track, exclusive of yard tracks and sidings, were laid in the United States in calendar year 1914. Compared with the construction in 1913 this was distributed among the states as follows:

SUMMARY SHOWING MILEAGE OF RAILWAYS BUILT IN THE UNITED STATES IN THE CALENDAR YEARS 1914 AND 1913, CLASSIFIED BY STATES.

State	Miles Built 1914	Miles Built 1913	State	Miles Built 1914	Miles Built 1913
Alabama.....	1.00	57.60	Nebraska.....	.88	26.47
Arizona.....		19.71	Nevada.....	10.01	59.56
Arkansas.....	27.10	139.29	New Hampshire.....		7.47
California.....	103.91	164.41	New Jersey.....	.80	1.47
Colorado.....		53.10	New Mexico.....	29.47	13.00
Delaware.....	1.15		New York.....	10.45	2.26
Florida.....	220.46	104.86	North Carolina.....	34.00	103.57
Georgia.....	14.66	81.98	North Dakota.....	63.24	152.08
Idaho.....	117.22	76.67	Ohio.....	17.05	28.00
Illinois.....	3.17	113.96	Oklahoma.....	4.00	34.00
Indiana.....	72.80	6.74	Oregon.....	90.42	122.89
Iowa.....	26.16	28.66	Pennsylvania.....	62.74	50.76
Kansas.....	11.00	36.21	South Carolina.....	66.00	32.70
Kentucky.....	31.57	48.34	South Dakota.....	41.30	38.00
Louisiana.....	7.79	44.43	Tennessee.....	11.21	111.29
Maine.....	.21	7.20	Texas.....	50.56	356.40
Maryland.....		.23	Utah.....	41.95	17.09
Massachusetts.....		9.82	Vermont.....		2.96
Michigan.....	18.81	163.93	Virginia.....	66.05	23.54
Minnesota.....	8.42	20.53	Washington.....	142.73	209.06
Mississippi.....	19.15	47	West Virginia.....	19.80	43.61
Missouri.....	4.32	30.25	Wisconsin.....	29.78	9.38
Montana.....	48.13	375.11	Wyoming.....	61.43	55.53
Total.....				1,531.80	3,071.12
Auxiliary Track.....				595.42	1,395.00
Total all Tracks.....				2,127.12	4,466.12

During the same periods respectively 1,978 and 3,012 miles were added to the railways of Canada. It will be noticed that less than half as many miles of line were built in the United States last year as in 1913. In fact the new construction in 1914 was the smallest in the twenty-two years included in the following table of mileage built since 1893, excepting only 1895:

CONSTRUCTION BY YEARS SINCE 1893

	Miles Built		Miles Built
1893.....	3,024	1905.....	4,388
1894.....	1,760	1906.....	5,623
1895.....	1,428	1907.....	5,212
1896.....	1,692	1908.....	3,214
1897.....	2,109	1909.....	3,748
1898.....	3,265	1910.....	4,122
1899.....	4,569	1911.....	3,066
1900.....	4,894	1912.....	2,997
1901.....	5,368	1913.....	3,071
1902.....	6,026	1914.....	1,532
1903.....	5,652	Total	
1904.....	3,832	Twenty-two Years.....	80,592

This total falls some 6,000 miles short of the increase in railway mileage in the United States since 1892, which indicates that the yearly totals average about 300 miles under the actual construction.

During the fiscal year 1913-1914, according to returns to the Bureau, 1,790 miles of new line were built.

MILEAGE OF ALL TRACKS.

In order to appreciate the provision made by the railways to handle the traffic of nearly 100,000,000 people, the student should study the following statement, which gives the mileage of all tracks by years since 1890:

SUMMARY OF MILEAGE OF SINGLE TRACK, SECOND, THIRD AND FOURTH TRACK AND YARD TRACK AND SIDINGS IN THE UNITED STATES, 1890 TO 1914.

Year	Single Track	Second Track	Third Track	Fourth Track etc.	Yard Track and Sidings	Total Mileage Operated (all Tracks)
1914 Bureau.....	245,894	27,644	2,721	1,922	97,852	376,033
1913 Official.....	⊙*244,418	26,270	2,589	1,964	94,338	369,579
1912 ".....	*249,852	24,972	2,512	1,903	92,019	371,238
1911 ".....	*246,238	23,451	2,414	1,747	88,974	362,824
1910 ".....	*240,831	21,659	2,206	1,489	85,581	351,767
1909 ".....	*235,402	20,949	2,169	1,453	82,376	342,351
1908 ".....	*230,494	20,209	2,081	1,409	79,452	333,646
1907 ".....	227,455	19,421	1,960	1,390	77,749	327,975
1906 ".....	222,340	17,396	1,766	1,279	73,760	317,083
1905 ".....	216,973	17,056	1,609	1,215	69,941	308,796
1904 ".....	212,243	15,824	1,467	1,046	66,492	297,073
1903 ".....	205,313	14,081	1,303	963	61,560	283,821
1902 ".....	200,154	13,720	1,204	895	58,220	274,195
1901 ".....	195,561	12,845	1,153	876	54,914	265,352
1900 ".....	192,556	12,151	1,094	829	52,153	258,784
1899 ".....	187,543	11,546	1,047	790	49,223	250,142
1898 ".....	184,648	11,293	1,009	793	47,589	245,333
1897 ".....	183,284	11,018	995	780	45,934	242,013
1896 ".....	182,428	10,685	990	764	44,912	240,129
1895 ".....	180,657	10,639	975	733	43,888	236,894
1894 ".....	178,708	10,499	953	710	42,561	233,533
1893 ".....	176,461	10,051	912	668	42,043	230,137
1892 ".....	171,563	9,367	852	626	39,941	222,351
1891 ".....	168,402	8,865	813	599	37,318	215,990
1890 ".....	163,597	8,437	760	561	35,255	208,612

⊙Class I and II only.

*Since 1903 the official mileage is exclusive of switching and terminal companies. In 1908 these had 1,624 miles of main track and 2,085 of yard tracks and sidings; in 1909 they reported 1,623 miles of main track and 2,384 of yard tracks and sidings and in 1910, 1,614 and 2,270 miles respectively; in 1911, respectively 1,797 and 3,171 miles, and in 1912, respectively 1,614 and 3,080 miles.

In yard tracks and sidings alone the United States has more miles of track than the single track mileage of Germany, France and the United Kingdom combined.

DISTRIBUTION OF RAILWAY TRACK BY GROUPS.

How the 376,033 miles of track in 1914 was distributed among the Commission's territorial groups, as compared with 1890, when such assignment was first made, is shown in the following summary:

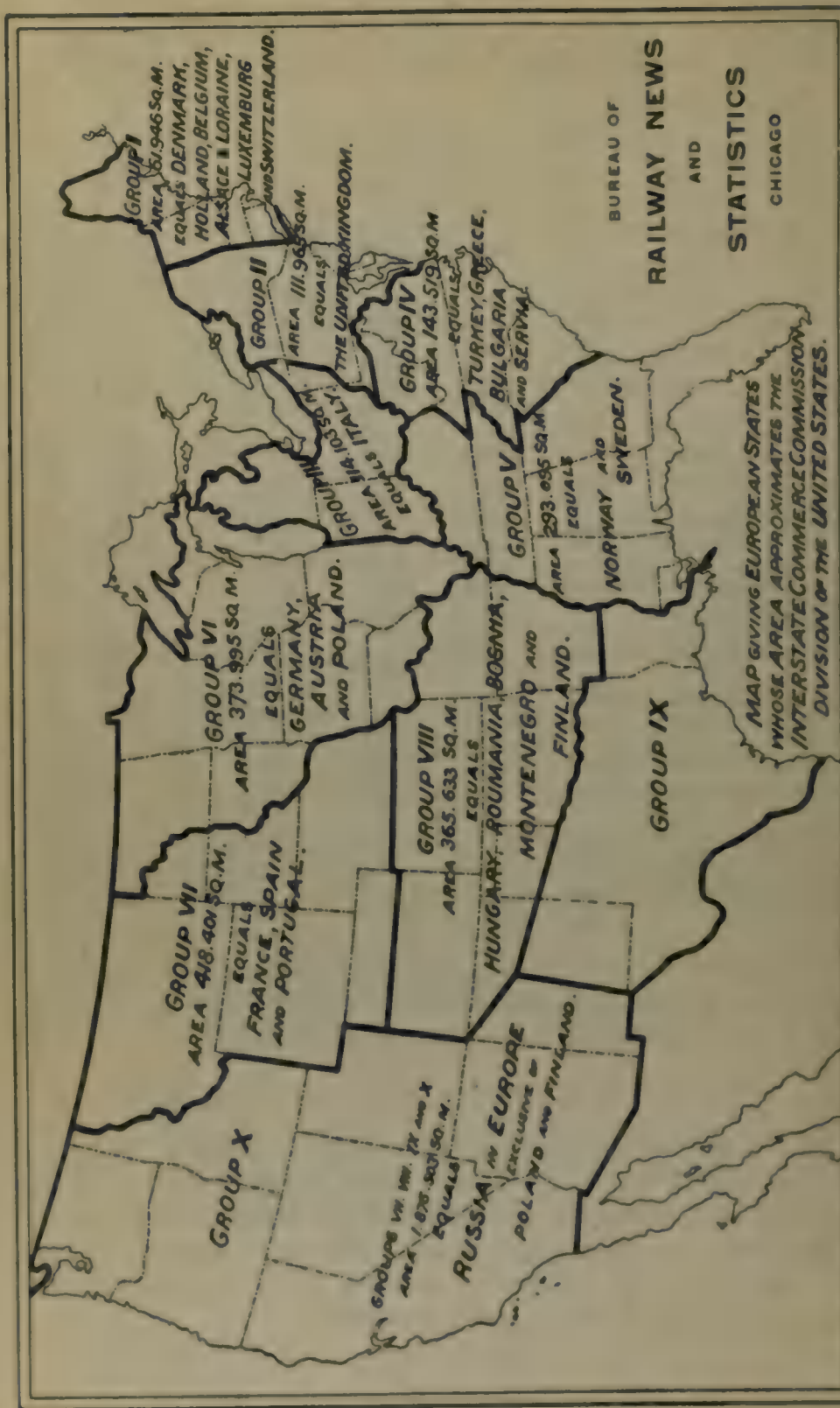
SUMMARY OF MILEAGE, BY GROUPS, SHOWING LENGTH OF SINGLE TRACK, SECOND, THIRD AND FOURTH TRACKS, YARD TRACK AND SIDINGS, 1890 TO 1914.

Group Covered		Single Track Miles	Second Track Miles	Third Track Miles	Fourth Track Miles	Yard Tracks and Sidings Miles	Total All Tracks Miles
I. Me., N. H., Vt., Mass.	1914	7,822	1,587	139	132	3,948	1,362
R. I., and Conn.	1890	7,425	1,248	29	19	2,399	11,120
II. N. Y., N. J., Penn.	1914	22,604	8,065	1,414	1,092	17,452	50,627
Del., Md. and Dist. of Col.	1890	17,237	4,948	664	507	7,533	30,899
III. Ohio, Ind., and So.	1914	25,989	5,753	841	511	15,508	48,602
Pen. of Mich.	1890	20,903	1,048	12	3	6,179	28,145
IV. Va., W. Va., N. C. and	1914	15,364	1,581	16	4	5,657	22,722
S. C.	1890	8,658	26			1,115	9,799
V. Ga., Fla., Ky., Tenn.,	1914	31,080	1,564	28	28	9,928	42,728
Ala., and Miss.	1890	15,877	4			2,149	18,300
VI. Ill., Ia., Wis., Minn.	1914	55,826	4,886	234	126	19,513	80,585
and parts Mich., Mo.,	1890	38,198	1,012	54	31	7,594	46,889
N. D. and S. D.							
VII. Neb., Mont., Wyo. and	1914	12,730	1,513	■	2	4,260	18,511
parts of Colo., N. D.	1890	8,807	13			1,307	10,127
and S. D.							
VIII. Kan., Ark., Okla. and	1914	32,775	1,720	34	18	9,985	44,532
parts of Mo., Colo.,	1890	21,173	93	2	1	3,111	24,380
Tex., and N. M.							
IX. La., Tex. (except Pan-	1914	17,169	40			4,489	21,598
handle) and parts of	1890	7,988				936	8,924
N. M.							
X. Wash., Ore., Cal., Ida.,	1914	24,535	935	9	9	7,112	32,600
Nev., Utah, Ariz.,	1890	10,135	45			1,387	11,567
and parts N. M.							
United States	1914	245,894	27,644	2,721	1,922	97,852	376,033
	1890	156,404	8,437	760	561	33,711	199,875

It will be perceived that the group which includes Texas—that *imperium in imperio* in the matter of railway regulation—worries along without a single mile of third or fourth track.

CONDITIONS IN THE UNITED STATES AND EUROPE.

Railway conditions relative to area and population in the United States and Europe may be studied in the accompanying map of the Commission's groupings compared with the European states whose areas they most closely approximate. The map should be studied in connection with the following summary giving the population and railway mileage of the respective divisions:



SUMMARY SHOWING POPULATION AND RAILWAY MILEAGE OF THE AMERICAN GROUPS AND EUROPEAN COUNTRIES SHOWN ON THE ACCOMPANYING MAP.

Division	United States		Europe	
	Population 1914	Miles of Railway 1914	Population	Miles of Railway
I.....	6,962,079	7,822	22,376,100	14,307
II.....	22,512,283	22,604	46,035,570	23,441
III.....	10,782,395	25,989	35,238,997	10,800
IV.....	7,765,764	15,364	15,768,797	3,827
V.....	13,022,655	31,080	7,995,974	10,770
VI.....	14,899,907	55,826	106,697,937	53,054
VII.....	2,539,579	12,730	65,148,182	42,590
VIII.....	8,532,363	32,775	33,735,416	17,581
IX and X.....	11,892,056	41,704	122,550,700	36,271
Total.....	*98,781,324	245,894	455,547,673	212,641

*U. S. Census Estimate, July 1, 1914, 98,900,081

Here, it will be perceived, the disparity in ratio of mileage to population is over 5 to 1 in favor of the American citizen, the ratio there being one mile of railway to every 2,142 European, while here it is one mile to every 404 Americans.

RAILWAY MILEAGE IN FOREIGN COUNTRIES.

While returns for certain countries bring information respecting some foreign railways down to a later date, considerations of continuity of compilation justifies the publication of the following statement from the *Archiv fur Eisenbahnwesen*, May-June, 1914, of the Railways of the World, divided between state and private ownership, for 1912:

SUMMARY OF THE WORLD'S RAILWAYS AND RATIO OF MILEAGE TO AREA AND POPULATION IN EACH COUNTRY, TOGETHER WITH STATE-OWNED MILEAGE IN 1912.

Countries	Mileage in 1912		Miles of Line per 100 Sq. Miles	Inhabitants per Mile of Line
	State Railways	Total Railways		
I. EUROPE				
Germany.....	36,150	38,894	18.7	1,695
Austria-Hungary (including Bosnia and Herze- govina).....	22,959	28,408	10.9	1,789
Great Britain and Ireland.....	.....	23,360	19.3	1,940
France.....	5,543	31,145	15.1	1,257
Russia in Europe (including Finland 2,329 miles).....	24,442	38,563	1.9	3,354
Italy.....	8,809	10,800	9.8	3,157
Belgium.....	2,685	5,370	47.2	1,376
Luxemburg.....	122	326	32.5	756
Netherlands.....	1,099	1,978	15.5	2,927
Switzerland.....	1,699	2,982	18.7	1,192
Spain.....	.....	9,517	5.0	1,963
Portugal.....	695	1,850	5.1	2,927
Denmark.....	1,215	2,338	15.8	1,102
Norway.....	1,630	1,916	1.6	1,220
Sweden.....	2,760	8,848	5.1	617
Servia.....	356	580	3.1	4,879
Roumania.....	2,163	2,243	4.3	3,038
Greece.....	.....	1,000	4.0	2,639
Bulgaria.....	1,197	1,197	3.2	3,578
Turkey in Europe.....	.....	1,042	1.6	5,962
Malta, Jersey, Isle of Man.....	.....	68	16.1	5,367
Total for Europe, 1912.....	111,745	212,425	5.6	2,064
“ “ “ 1911.....	109,719	210,574	5.6	2,063
“ “ “ 1910.....	107,727	207,444	5.5	2,180
“ “ “ 1909.....	.....	204,864	5.5	1,923
“ “ “ 1908.....	.....	201,619	5.3	1,941
“ “ “ 1907.....	.....	199,345	5.3	1,887
“ “ “ 1906.....	.....	196,437	5.2	1,993
“ “ “ 1905.....	.....	192,607	5.1	2,084
“ “ “ 1904.....	.....	189,806	5.0	2,094
“ “ “ 1903.....	.....	186,685	5.0	2,094
“ “ “ 1902.....	.....	183,989	4.9	2,127
“ “ “ 1901.....	.....	180,817	4.8	2,174
“ “ “ 1900.....	.....	176,396	4.7	2,220
“ “ “ 1899.....	.....	172,953	4.6	2,220
“ “ “ 1898.....	.....	167,614	4.4	.....
“ “ “ 1897.....	.....	163,550	4.3	.....
“ “ “ 1896.....	.....	160,030	4.2	.....
Increase in seventeen years.....	.....	52,395	.....	.....

Countries	Mileage in 1912		Miles of Line per 100 Sq. Miles	Inhabitants per Mile of Line
	State Railways	Total Railways		
II. AMERICA				
Canada.....	1,768	26,660	0.8	243
United States of America (inclusive of Alaska 338 miles).....		249,790	6.9	437
Newfoundland.....		768	1.8	308
Mexico.....	7,850	15,803	2.1	920
Central America.....	359	1,978		
Greater Antilles.....	150	3,391		
Lesser Antilles.....		336		
Colombia.....		621	0.13	7,318
Venezuela.....	68	632	0.16	3,833
British Guiana.....		106	0.11	2,825
Dutch Guiana.....		37		
Ecuador.....		651	0.64	2,146
Peru.....	1,048	1,661	0.32	2,776
Bolivia.....		893	0.16	2,555
Brazil.....	6,386	13,819	0.5	1,533
Paraguay.....		232	0.16	2,728
Uruguay.....		1,639	2.4	636
Chili.....	1,977	3,950	1.3	838
Argentine Republic.....	2,490	20,596	1.9	237
Total for America.....	22,206	343,957		
III. ASIA				
Central Russia in Asia.....	2,966	4,061	1.9	2,300
Siberia and Manchuria.....	3,825	6,739	0.14	1,046
China.....		6,113	0.14	53,666
Japan (including Corea).....	4,860	6,811	2.7	9,470
British India.....	29,252	33,404	1.8	8,944
Ceylon.....		578	2.4	7,000
Persia.....		34	0.005	268,333
Asia Minor, Syria, Arabia, including Cyprus.....	912	3,279	0.5	5,962
Portuguese Indies.....		51	3.5	11,500
Malay Archipelago.....		857	2.6	838
Dutch Indies.....	1,376	1,599	0.6	17,848
Siam.....	592	700	0.32	13,416
Cochin China.....		2,294		
Total for Asia.....	43,790	66,482		

Countries	Mileage in 1912		Miles of Line per 100 Sq. Miles	Inhabitants per Mile of Line
	State Railways	Total Railways		
IV. AFRICA				
Egypt.....	2,792	3,674	1.0	3,096
Algiers and Tunis.....	1,803	3,966	1.1	1,695
Belgian Congo.....		861		
South African Union, including Cape Colony, Natal, Cent. So. African and Rhodesian Rail- ways.....	7,530	10,610		
COLONIES				
German.....	2,398	2,398		
English.....	1,314	1,950		
French.....		1,946		
Italian.....				
Portuguese.....		1,002		
Total for Africa.....	15,829	26,483		
V. AUSTRALIA				
New Zealand.....	2,760	2,883	2.7	353
Victoria.....	3,515	3,665	4.2	346
New South Wales.....	3,757	4,092	1.3	389
South Australia.....	2,077	2,114	0.16	205
Queensland.....	3,986	4,625	0.6	196
Tasmania.....	471	699	2.7	266
West Australia.....	2,374	3,422	0.32	138
Hawaii, etc.....		88	1.3	1,239
Total for Australia.....	18,922	21,582	0.6	277
RECAPITULATION				
I. Europe.....	111,745	212,430	5.6	2,064
II. America.....	22,208	343,560		
III. Asia.....	43,790	66,490		
IV. Africa.....	15,828	26,480		
V. Australia.....	18,922	21,578	0.6	277
Total.....	212,493	670,538		

NOTE. The details and additions in these tables do not always agree.

Here it appears that less than one-third of the railway mileage of the world has been nationalized. In proportion to area, exclusive of Alaska, we are served by eight miles of line to Europe's 5.6. The difference in relation to population has already been referred to. On the European basis we would have less than 45,000 miles of line where we now have over 250,000 miles.

II

EQUIPMENT

The returns on equipment, both that owned on June 30, 1914, and that built during the calendar year, together with the record of surplus freight cars at the end of the year, prove that the railways of the United States were fully prepared to handle a volume of traffic at least 15% beyond that offered. But the returns also show that during the past seven years the provision of equipment has not kept pace with a 6% annual growth of traffic, which is below normal. From 1908 to 1914, inclusive, there were 25,996 locomotives and 895,146 freight cars built in the United States against 35,852 and 1,209,414, respectively, for the seven years 1901 to 1907. Between 1900 and 1907 the number of locomotives owned increased 18,204 and freight cars 626,026 against an increase of only 8,563 and 312,710, respectively, between 1907 and 1914. Nor does the difference in power and capacity of locomotives and cars alter the relative rate of increase, as both increased more rapidly during the earlier period.

The year 1907 is chosen as the dividing line in these comparisons because in that year the equipment and facilities of American railways proved inadequate to meet the demands of traffic. The facts in regard to the locomotives and cars built in the United States are set forth in the following table compiled by the *Railway Age-Gazette* since 1899:

SUMMARY SHOWING THE NUMBER OF CARS AND LOCOMOTIVES BUILT DURING THE YEARS 1899 TO 1914

Year	Locomo- tives	Number Passenger Cars	Freight Cars
1914†.....	2,235	3,691	104,541
1913†.....	5,332	3,296	207,684
1912†.....	4,915	3,060	152,429
1911*.....	3,530	4,246	72,161
1910*.....	4,755	4,412	185,357
1909*.....	2,887	2,849	96,419
1908*.....	2,342	1,716	76,555
1907*.....	7,362	5,457	284,188
1906*.....	6,952	3,167	243,670
1905*.....	5,491	2,551	168,006
1904.....	3,441	2,144	60,806
1903.....	5,152	2,007	153,195
1902.....	4,070	1,948	162,599
1901.....	3,384	2,055	136,950
1900.....	3,153	1,636	115,631
1899.....	2,475	1,305	119,886
Total.....	67,476	45,540	2,340,077

*Includes Canadian output.

†Includes Canadian output and equipment built in railroad shops.

NUMBER AND CAPACITY OF LOCOMOTIVES.

The next summary gives the number, tractive power and weight of steam locomotives since the Commission has included their capacity in its reports:

SUMMARY SHOWING NUMBER, POWER AND WEIGHT OF LOCOMOTIVES
IN THE UNITED STATES DURING THE YEARS 1914 TO 1902.

Year	Number	Tractive Power (Pounds)	Weight without Tender (Tons)	Average Weight (Tons)
1914 Reported to Bureau.....	64,430	1,997,604,184	5,413,250	84
1913 " " ".....	63,198	1,907,899,088	5,172,213	81.8
1913 Official [Ⓐ]	*32,211	1,847,798,393	5,004,720	■
1912 ".....	*61,010	1,746,964,128	4,719,251	77
1911 ".....	*60,162	1,681,495,905	4,537,653	75
1910 ".....	*58,240	1,588,894,480	4,224,208	73.6
1909 ".....	*56,468	1,503,971,444	4,056,733	72.0
1908 ".....	†56,867	1,498,793,551	4,012,553	71.0
1907 ".....	55,388	1,429,626,658	3,828,045	69.1
1906 ".....	51,672	1,277,865,673	3,459,052	66.9
1905 ".....	48,357	1,141,330,082	3,079,673	63.6
1904 ".....	46,743	1,063,651,261	2,889,492	62.1
1903 ".....	43,871	953,799,540	2,606,587	59.3
1902 ".....	41,225	839,073,779	2,323,877	56.3
Increase in twelve years to 1914	56.3%	138.1%	133.%	49.2%

[Ⓐ]Class I and II roads. In 1912 Class III roads reported 986 locomotives.

*Excludes locomotives in service of switching and terminal companies; also unclassified and Mallet locomotives, numbering in 1912 respectively 718 and 534; in 1911, 730 and 435; in 1910, 707 unclassified and in 1909, 744 unclassified.

†Excludes 831 unclassified locomotives but includes 858 locomotives of switching and terminal companies. Previous years include both switching and terminal companies and unclassified.

EQUIPMENT PREVIOUS TO 1902.

Previous to 1902 the reports of the Commission were confined to the number of locomotives and cars, irrespective of capacity, as follows:

	Locomotives	Passenger Cars	Freight Cars	Company Cars
1901.....	39,584	35,969	1,464,328	50,536
1900.....	37,663	34,713	1,365,831	50,594
1899.....	36,703	33,850	1,295,510	46,556
1898.....	36,234	33,595	1,248,826	43,753
1897.....	35,986	33,626	1,221,730	42,124
1896.....	35,950	33,003	1,221,887	42,759
1895.....	35,699	33,112	1,196,119	41,330
1894.....	35,492	33,018	1,205,169	39,891
1893.....	34,788	32,911	1,201,273	39,762
1892.....	33,136	28,876	966,998	36,901
1891.....	32,139	27,949	947,300	35,185
1890.....	30,140	26,820	918,491	32,895
1889.....	29,036	24,586	829,885	31,020

From this it appears that since 1889 there has been an increase of nearly 122% in the number of locomotives. As their average weight, exclusive of tenders, in the meantime has increased from 40 to over 84 tons, their capacity during the 25 years has undoubtedly increased 365%. Their tractive power has increased in a slightly greater ratio.

PASSENGER AND FREIGHT CARS.

Our next summary brings the data respecting passenger and freight cars down from where it is left in the foregoing table to 1914, with the vital information as to the capacity of freight cars since 1902:

SUMMARY OF PASSENGER AND FREIGHT CARS, AND CAPACITY OF LATTER FROM 1902 TO 1914.

Year	Passenger Service	Freight Service		Average Tons	Company's Service Number
		Number	Capacity Tons		
1914 Reported to Bureau.....	52,004	\$2,304,267	89,784,883	38.9	133,816
1913 " " ".....	50,849	2,260,495	88,466,818	39.1	119,810
1913 Official © *.....	51,700	2,273,289	86,978,145	38	120,244
1912 " *.....	51,490	2,215,549	82,965,418	37	115,635
1911 " *.....	49,818	2,195,511	81,083,698	37	114,006
1910 " *.....	47,095	2,135,121	76,864,356	36	108,115
1909 " *.....	45,584	2,071,328	73,137,546	35	99,090
1908 " *.....	45,117	12,096,234	73,066,522	35	96,762
1907 ".....	43,973	1,991,557	67,216,144	34	91,064
1906 ".....	42,262	1,837,914	59,196,230	32	78,736
1905 ".....	40,713	1,731,409	53,372,552	31	70,740
1904 ".....	39,752	1,693,194	50,874,723	30	66,615
1903 ".....	38,140	1,653,782	48,622,125	29	61,467
1902 ".....	36,987	1,546,101	43,416,977	28	57,097
Twelve years' increase.....	40.6%	49%	106.8%	38.9%	134.3%

© Class I and II roads only. Class III roads in 1912 reported 915 passenger and 12,126 freight cars.

*Does not include cars in service of switching and terminal companies.

†Includes 11,067 ~~cars~~ of switching and terminal companies and excludes 4,550 cars for which complete returns were not secured.

§Of these, 1,090,372 were box and refrigerator cars, capacity 37,665,937 tons; and 879,818 coal cars, capacity 39,640,057 tons.

In connection with the equipment built annually this table affords light on what proportion is needed to replace that destroyed, worn out or abandoned, as follows:

	Locomotives	Passenger Cars	Freight Cars
Built 1914	2,235	3,691	104,541
Increase in 1914 ..	1,232	1,155	43,772
For replacements.	1,003	2,536	60,769

While these results as to replacements are not exact because they include equipment built for Canadian roads, they are significant as indicating the nature of the struggle between adequate facilities and the "scrap heap." The large number of passenger cars in the replacement list is due to the continued activity in substituting modern steel for wooden cars.

STEEL PASSENGER CARS IN SERVICE.

The Bureau is indebted to the courtesy of the Committee on Relation of Railway Operation to Legislation for the accompanying statement showing the progress made in equipping American railways with steel passenger cars, brought down to Jan. 1, 1915.

	Steel	Steel Under-frame	Wooden
January 1, 1915.....	12,555	5,535	44,263
January 1, 1914.....	9,492	4,608	44,560
January 1, 1913.....	7,271	3,296	46,926
January 1, 1912.....	5,347	2,399	48,126
January 1, 1911.....	3,133	1,636	50,201
January 1, 1910.....	1,117	1,098	.....
January 1, 1909.....	629	673	.....
Increase 1914 over 1909.....	11,926	4,862	.....

Next year the official returns promise more definite information respecting the age, construction and seating capacity of passenger cars.

COST OF ALL RAILWAY EQUIPMENT.

In regard to the cost of this vast array of constantly perishing rolling stock, official figures are lacking. From the preceding data, however, it is evident that American railway equipment is mostly modern; that is, a large proportion of it has been built in the twentieth century. The returns show that from 1900 to 1914, inclusive, the number of locomotives built was 65,001, of passenger cars 44,235 and of freight cars 2,220,191. By a marked coincidence these figures tally very closely with those of existing equipment, except in the case of passenger cars. They are warrant for the estimate that four-fifths of our present equipment of locomotives and freight cars and three-quarters of our passenger cars have been purchased since 1900.

With locomotives costing from \$10,000 to \$30,000 and upwards, and one of the largest manufacturers reporting an average sales price of \$18,270 four years ago, \$16,000 is a conservative estimate

of the cost of all locomotives. From independent data the cost of steel passenger cars is placed at \$12,000 and of wooden passenger equipment at \$6,500; freight cars at \$900 and company cars at \$500. Upon this basis we arrive at the following estimate of

COST OF RAILWAY EQUIPMENT

(245,894 MILES REPRESENTED.)

64,430 Locomotives @ \$16,000.....	\$1,030,880,000
11,650 Steel Passenger cars @ \$12,000.....	139,800,000
40,354 Wooden Passenger @ \$6,500.....	262,301,000
2,304,267 Freight cars @ \$900.....	2,073,840,300
133,816 Company's @ \$500.....	66,908,000
Total cost of equipment.....	\$3,573,729,300

Some idea of the cost of locomotives in Europe may be had from the report of our consul general at Genoa that recently the Italian Government had ordered 215 new locomotives from Italian firms "as is usual for the encouragement of national industry." The prices paid ranged from 32 to 40 cents per kilo (2.2046 pounds). The average was well over 15 cents per pound. Had our locomotive builders received any such fostering price, the cost of American locomotives for weight on drivers only would have been \$1,600,000,-000. Moreover the Italian price was on the entire weight of locomotive and tender.

EQUIPMENT BY I. C. C. GROUPS.

The next summary distributes railway equipment according to the territorial groups, abandoned by the Commission's department of statistics since 1910, with which comparison is made:

SUMMARY SHOWING ASSIGNMENT OF EQUIPMENT BY TERRITORIAL GROUPS FOR THE YEARS ENDING JUNE 30, 1914 AND 1910.

Territory Covered	Locomotives		Cars Passenger Service		Cars Freight Service	
	1910 Official	1914 Bureau	1910 Official	1914 Bureau	1910 Official	1914 Bureau
Group I.....	3,297	2,942	5,356	5,064	83,091	82,262
Group II.....	13,607	14,155	12,281	13,742	516,299	523,574
Group III.....	8,994	10,361	5,593	6,292	402,918	424,315
Group IV.....	3,102	4,157	2,097	2,432	123,831	164,398
Group V.....	4,700	6,298	3,403	4,257	170,786	231,103
Group VI.....	10,707	11,531	7,611	8,241	428,353	420,830
Group VII.....	2,480	2,477	1,698	1,968	74,166	80,238
Group VIII.....	5,971	6,152	3,874	4,310	189,138	201,208
Group IX.....	2,427	2,331	1,506	1,587	60,015	60,291
Group X.....	3,662	4,026	3,686	4,102	86,527	115,346
United States.....	*58,947	64,430	*47,095	52,064	*2,135,121	2,304,267

*Exclusive of equipment of switching and terminal companies, included in Bureau's figures

Although these figures are not strictly comparable because of differences in the arbitrary assignment of some roads operating in several groups, they yet afford valuable testimony to the general distribution of railway equipment throughout the Union.

NUMBERS OF DIFFERENT CLASSES OF FREIGHT CARS.

The next statement gives the number of the several classes into which cars are divided, as reported to the Commission since 1902:

Year	Box Cars	Flat Cars	Stock Cars	Coal Cars	Tank Cars	Refrigerator Cars	Other Cars
1913* [©]	1,032,585	147,541	78,308	871,339	8,216	43,389	91,911
Average capacity in Tons.....	34	35	31	44	40	31	41
1912*.....	1,004,005	150,840	76,535	855,111	7,836	30,693	90,219
1911*.....	990,313	153,300	77,590	853,699	7,787	31,786	80,856
1910*.....	966,577	153,918	77,584	818,689	7,434	30,918	78,411
1909*.....	941,533	154,630	73,494	792,291	6,630	28,204	74,556
1908.....	950,209	159,749	76,219	805,185	6,888	27,930	70,054
1907.....	904,821	156,860	69,997	746,670	5,972	33,617	68,080
1906.....	843,118	146,908	64,202	686,717	5,324	31,782	55,584
1905.....	802,964	146,050	62,938	632,171	4,918	26,844	51,685
1904.....	780,445	147,226	64,270	622,568	4,520	22,735	46,577
1903.....	765,820	154,074	61,790	595,963	4,421	21,454	47,093
1902†.....	708,861	142,303	57,668	534,448	3,533	18,222	40,957
Average capacity in Tons.....	27	26	25	31	30	26	27

*Excludes switching and terminal companies.

†Exclusive of 40,109 ~~cars~~ for which complete returns were not secured, a condition which did not recur subsequently, though in each year a number are excluded for incomplete returns.

©Class I and II roads only.

For 1914 the returns to this Bureau show 1,090,372 box and refrigerator cars and 879,818 coal cars, a substantial gain in these two classes.

EQUIPMENT OF FOREIGN RAILWAYS.

It may be of interest to compare the foregoing facts relating to the equipment of American railways with the corresponding data for foreign railways so far as they are ascertainable, as follows:

SUMMARY SHOWING THE NUMBER OF LOCOMOTIVES, PASSENGER
CARS AND FREIGHT CARS OF THE PRINCIPAL
COUNTRIES OF THE WORLD.

	Locomotives	CARS	
		Passenger Service	Freight Service
United Kingdom.....	22,998	72,883	780,524
Germany.....	28,788	79,529	650,474
France.....	14,087	32,847	391,192
Russia.....	20,244	22,399	445,014
Austria.....	7,494	14,761	148,564
Hungary.....	4,219	9,142	99,285
Italy.....	3,744	8,647	69,427
Spain.....	2,533	6,189	50,109
Belgium.....	4,288	7,886	87,359
Netherlands.....	1,186	3,056	21,737
Denmark.....	629	1,606	9,664
Sweden.....	1,952	3,600	47,267
Norway.....	404	788	17,833
Switzerland.....	1,594	4,879	18,344
Roumania.....	821	1,782	21,279
Bulgaria.....	212	335	4,625
Servia.....	87	247	3,118
Canada.....	5,119	5,096	182,221
British India.....	7,612	21,985	157,096
Australia.....	3,036	4,867	66,096
New Zealand.....	513	1,282	19,515
British South Africa.....	1,421	2,288	23,344
Argentina.....	2,781	2,294	50,612
Japan.....	2,499	6,453	42,705
Total Twenty-four Countries.....	138,261	313,416	3,407,404
United States.....	64,430	52,004	2,304,267

It is probable that the 64,430 American locomotives are more powerful than all the 138,261 foreign locomotives, and the capacity of the 2,304,267 American freight cars is certainly double that of the 3,407,404 foreign freight cars. The contrast in passenger cars reflects the difference in density of passenger traffic, although the seating capacity of American cars is greater per car.

In no respect is the equipment of European railways equal to ours. The greater part of their passenger cars have only two axles. Only recently in England they have adopted a scheme by which they join two old passenger cars on a single under-frame supported by two four-wheel bogies. The cost of a British "goods wagon" has been recently estimated by the *London Railway News* at £100 (\$500). In Germany their freight cars, which are the largest in Europe, have an average capacity of a little over 14 tons, less than 2.4% have more than two axles and less than 35% of all freight and baggage cars have brakes of any description. The average weight of the German locomotive is under 52 tons, including tender.

GERMAN PASSENGER CARS.

In 1912 the passenger equipment of German railways consisted of 62,649 cars, of which 24,221 had two axles; 29,583 three axles; 8,473 four axles and 372 six axles. To these should be added 16,880 baggage cars. Distributed by classes, the German passenger equipment for the last three years reported was as follows:

DISTRIBUTION OF GERMAN PASSENGER CAR EQUIPMENT TO CLASS OF TRAVEL IN 1910, 1911 AND 1912.

	1910	1911	1912
Class I.....	135	124	139
Class I and II.....	6,323	6,220	6,085
Class I, II and III.....	1,369	1,370	1,378
Class II.....	2,005	3,210	3,447
Class II and III.....	5,736	6,044	6,331
Class II, III and IV.....	38	37	■
Class III.....	24,961	25,992	27,485
Class III and IV.....	483	510	509
Class IV.....	14,931	15,655	16,528
Special.....	663	685	508
Total.....	57,644	59,857	62,649

Note that the gain is practically confined to the lower class cars.

SURPLUS OF AMERICAN FREIGHT CARS.

Where the government railways of Germany before the war were struggling with shortages, American railways since November, 1907, have been vexed with a surplus, as the accompanying statement shows. This summary, which is cast in a new form to preserve its continuity, is compiled from reports of the Committee on Car Efficiency of the American Railway Association since 1907:

FREIGHT CAR SHORTAGE AND SURPLUS, BY MONTHS, FROM JANUARY, 1907, TO MARCH, 1915.

Year	January	February	March	April	May	June
1907 Net Shortage.....	85,000	140,000		81,000	40,000	4,000
1908 Net Surplus.....	341,842	321,264	296,035	413,338	404,375	349,567
1909 ".....	332,513	300,971	290,868	296,320	284,292	262,117
1910 ".....	26,844	41,309	17,342	77,357	122,593	126,497
1911 ".....	119,820	173,667	207,261	186,053	187,278	163,170
1912 ".....	90,285	13,958	30,043	79,389	116,201	67,318
1913 ".....	28,439	22,183	37,775	57,498	50,294	63,927
1914 ".....	214,889	197,052	194,865	212,869	238,642	241,502
1915 ".....	(no report)	279,411	321,747	313,073		

Year	July	August	September	October	November	December
1907 Net Shortage.....	44,000	20,000	42,000	86,811	44,802	208,536
1908 Net Surplus.....	308,171	252,149	170,652	100,073	109,515	221,058
1909 " "	243,015	157,415	71,373	5,740	12,032	34,300
1910 " "	142,865	73,679	47,076	7,235	13,541	51,413
1911 " "	149,072	104,170	64,243	20,532	26,514	76,814
1912 " "	68,922	43,901	8,620	31,579	51,259	34,392
1913 " "	69,405	54,425	40,159	6,048	22,652	101,545
1914 " "	226,541	172,145	136,049	151,982	170,096	(no report)
1915 " "						

*Net Shortage shown in heavy face type. Figures are for mid-month except when turning point occurred elsewhere. Those for 1915, are for the first of the month.

This table affords almost as significant a barometer of American industry as the statistics of railway income. So true is this that when the Committee, on the plea of economy, discontinued its compilation along with some dividends last fall, the popular demand for its continuation induced its revival in February.

FREIGHT CAR PERFORMANCE.

Reports to the Committee on Relations between Railroads of the American Railway Association provide the data regarding freight car efficiency given in the next summary:

SUMMARY SHOWING THE AVERAGE PERFORMANCE OF AMERICAN AND CANADIAN FREIGHT CARS DURING THE YEARS ENDING JUNE 30, 1914, 1913, 1912 AND 1909, AND AVERAGE CAR LOAD IN 1914 AND 1913.

Month Year Ending June 30.	Average Miles per Day per Car				Average Ton Miles per Car per Day				Average Tons per Loaded Car	
	1913-14	1912-13	1911-12	1908-09	1913-14	1912-13	1911-12	1908-09	1913-14	1912-13
July.....	23.7	23.2	21.9	20.0	376	362	317	275	23.2	22.5
August.....	25.2	24.3	22.9	20.8	382	385	350	292	22.5	22.3
September.....	24.3	24.4	23.8	22.0	401	395	363	320	23.3	22.3
October.....	25.7	26.0	26.0	23.6	423	433	342	346	23.2	22.9
November.....	25.7	26.0	24.4	23.5	405	424	376	341	22.8	22.8
December.....	23.5	24.4	23.4	22.3	369	396	361	332	23.9	23.2
January.....	22.9	24.3	20.4	20.9	338	392	325	293	22.9	23.6
February.....	21.8	24.7	22.9	21.7	333	395	370	306	22.6	22.9
March.....	23.8	23.7	24.5	22.7	369	374	389	330	21.0	22.7
April.....	23.0	24.0	23.3	22.4	334	369	340	310	24.1	22.2
May.....	22.2	25.0	23.7	22.5	320	387	350	304	21.2	22.0
June.....	22.7	24.3	24.1	22.4	345	377	366	314	22.5	22.8

The first column tells as plainly as figures can speak that the pressure of American business on American railways began to slacken in September, 1913. The loading of the cars was well maintained, but their movement began to slow up.

SAFETY APPLIANCES.

Although official statistics continue to devote much space to rolling stock equipped with automatic couplers and train brakes, the adoption of these characteristic American safety appliances has become so well-nigh universal (99.7% and 98%, respectively) as to rob them of contemporaneous interest.

BLOCK SIGNALS.

Steady progress is reported in placing American railways under the protection of the Block Signal System wherever traffic conditions call for it. The figures given below, compiled from the *Railway Age-Gazette* returns, indicate that considerable mileage is being transferred from manual to automatic operation:

	1914			1906
	Single Track (Miles)	Two or More Tracks (Miles)	Total	Total
Automatic Block Signals	13,408	16,281	29,689	9,743
Increase over preceding year			3,566	
Non-Automatic Block Signals	51,137	7,406	58,543	43,390
Decrease over preceding year			2,619	
Both classes	64,545	23,687	88,232	53,133
Increase over preceding year			1,047	
Increase in eight years			35,000	

This table shows that during the past eight years the installation of the Block Signal System has kept pace with the increase in operated mileage, which was about 35,000 miles. As a Committee of the American Railway Association has estimated the cost of such installation at \$1,232 per mile, American railways have invested over \$108,000,000 in this one means to safe operation.

Little progress has been made during the year in the search for a practicable automatic stop. Many have been tested, but none thus far justify the shift of responsibility from the man to a machine.

III

EMPLOYES AND THEIR COMPENSATION**Number 1,733,000.****Pay \$1,401,000,000**

With a reduction of 115,229 in the number of persons employed on June 30, 1914, compared with the same date in 1913, the 443 roads reporting to this Bureau paid to their employes within \$350,843 as much as was paid in 1913. This means that where the railways were able to effect economies in other directions they were unable to meet the loss in revenues with a corresponding cut in pay rolls. In other words, the effect of a reduction in staff was counteracted by the advance in the rate of pay.

Put in another way, where the pay roll in 1913 absorbed only 44% of gross revenues, in 1914 labor's share was 45.14%.

The average daily compensation paid to the army of nearly a million and three-quarters railway workers in 1914 was \$2.54 against \$2.49 in 1913. This average advance of 5 cents a day per man meant an increase of over \$26,000,000 to the pay roll in 1914. Compared with the average pay in 1905, when the Bureau first began compiling the information, it meant an addition of over \$253,000,000 to the cost of running the railways by reason of the raise in the scale of wages alone. And yet some people wonder, or affect to wonder, why the railways, with no corresponding raise in rates or fares, are not prosperous.

The aggregate number of days worked by the employes of the 443 roads reporting for 1914 was 539,187,000, or 319 days per person, as against 551,134,689 in 1913 when the average worked was 304. These averages are not strictly accurate because the number of men employed on June 30th is not an average for the year.

The first summary under this title gives the number, compensation and average pay of the several classes of the reporting roads for the year 1914.

SUMMARY OF RAILWAY EMPLOYES, COMPENSATION AND RATES OF PAY PER DAY BY CLASSES IN 1914, AND AGGREGATES FROM 1889 TO 1914.

1914 (245,894 Miles Represented) Class	Number	Per 100 Miles of Line	Compensation		
			Total	Average Pay Per Day	Per Cent of Gross Revenues
General Officers.....	3,905	1.6	20,300,232	\$16.11	0.6
Other Officers.....	10,685	4.3	23,821,324	6.49	0.8
General Office Clerks.....	86,502	35.2	75,225,019	2.53	2.5
Station Agents.....	37,822	15.4	31,217,225	2.37	1.0
Other Station Men.....	165,358	67.3	110,211,575	1.99	3.6
Enginemen.....	61,698	25.1	108,602,949	5.28	3.6
Firemen.....	65,001	26.4	66,736,996	3.23	2.2
Conductors.....	47,870	19.5	72,920,026	4.49	2.4
Other Trainmen.....	136,562	55.6	139,526,685	3.11	4.6
Machinists.....	56,202	22.9	58,059,236	3.28	1.9
Carpenters.....	72,194	29.4	60,061,063	2.67	2.0
Other Shopmen.....	256,254	104.2	191,019,044	2.37	6.3
Section Foremen.....	43,900	17.9	33,563,410	2.20	1.1
Other Trackmen.....	330,678	134.5	144,148,253	1.59	4.7
Switch Tenders, Crossing Tenders and Watchmen.....	38,213	15.5	23,102,844	1.72	0.8
Telegraph Operators and Despatchers.....	40,052	16.3	36,082,095	2.56	1.2
Employees acct. Floating Equpt.	12,936	5.2	9,466,840	2.40	0.3
All other Employees & Laborers	232,986	94.8	169,004,994	2.22	5.5
Total (97% Mileage Represented).....	1,698,818	691.1	1,373,069,811	2.54	45.14
1913 Official Figures(c).....	1,815,239	742	\$1,373,830,589	(b) \$2.49	43.96
1912 ".....	1,748,380	695	1,274,347,697	2.44	44.05
1911 ".....	1,702,164	687	1,230,186,019	2.42	43.32
1910.....	1,732,435	716	1,165,444,855	2.29	41.82
1909.....	1,528,808	638	1,005,349,958	2.24	41.00
1908.....	1,458,244	632	1,051,632,225	2.25	43.38
1907.....	1,672,074	735	1,072,386,427	2.20	41.42
1906.....	1,521,355	634	(a) 930,801,653	2.09	40.02
1905.....	1,382,196	637	839,944,680	2.07	40.34
1904.....	1,296,121	611	817,598,810	No data	41.86
1903.....	1,312,537	639	775,321,415	No data	40.78
1902.....	1,180,315	594	676,028,592	No data	39.28
1901.....	1,071,169	548	610,713,701	No data	38.39
1900.....	1,017,653	529	577,264,841	No data	38.82
1899.....	928,924	495	522,967,896	No data	39.81
1898.....	874,558	474	495,055,618	No data	39.70
1897.....	823,476	449	465,601,581	No data	41.50
1896.....	826,620	454	463,824,531	No data	40.77
1895.....	785,034	441	445,593,261	No data	41.44
1894.....	779,608	444	No data	No data	No data
1893.....	873,602	515	No data	No data	No data
1892.....	821,415	506	No data	No data	No data
1891.....	784,285	486	No data	No data	No data
1890.....	749,301	479	No data	No data	No data
1889.....	704,743	459	No data	No data	No data

(a) Includes \$30,000,000 estimate pay-roll of Southern Pacific, whose records were destroyed in the San Francisco disaster.

(b) Bureau computations.

(c) Exclusive of Class III and switching and terminal companies in 1913

In these figures is reflected the full effect of several wage arbitrations of 1912 and 1913, when the wages of enginemen, firemen, conductors and other trainmen in Eastern territory was advanced. Compared with 1912 the average for enginemen was 26 cents a day higher; for firemen, 20 cents; and for "other trainmen" 9 cents. How these advances affected the pay rolls can be seen in the following statement:

NUMBER AND COMPENSATION OF TRAIN HANDS, 1912 AND 1914.

	Number		Compensation	
	1912	1914	1912	1914
Enginemen	63,260	61,698	\$101,449,937	\$108,602,949
Firemen	66,423	65,001	61,309,898	66,736,996
Conductors	48,792	47,870	67,372,682	72,920,026
Other trainmen	135,508	136,562	127,285,178	139,526,685
Total	313,983	311,131	\$357,417,695	\$387,786,656
Decrease.....		2,852	Increase.....	20,368,961

UNREMUNERATIVE EXPENDITURES.

But of all the increased expenditures which roll up from year to year, like a snowball, that under the heading of "General Office Clerks" invites public attention. In any well-organized industry this item should decrease relatively to expanding revenues. In 1914 the compensation for this necessary but unproductive class of employes was 2.5% of operating revenues against 1.9% in 1907. What this meant absolutely may be shown thus:

Compensation of General Office Clerks, 1914.....	\$75,225,019
Compensation of General Office Clerks, 1907.....	48,340,123
Increase in seven years.....	\$27,884,896
Increase per cent.....	57.6%

Meanwhile operating revenues increased less than 19%! Had general office clerks received the same proportion of operating revenue in 1914 that they did in 1907 they would have received about \$58,000,000 and the railways would have been saved \$17,000,000.

This \$17,000,000 is part of the annual tribute forced upon the railways by a system of regulation that spends too much of its own time and that of railway officials diagnosing petty ailments when the patient is dying from inanition.

AVERAGE COMPENSATION 1914-1892.

If the reader does not keep a file of the *Statistics* he had better cut out and preserve the next statement, which gives in tabular form the data respecting the daily compensation of railway employes since the Commission first called for it in 1892. It may be possible to devise some form which will present these results with more scientific accuracy, but it will take twenty-two years for any system to provide any such presentment of the general trend of railway compensation. If out of the wreck of continuity the Bureau can preserve any portion of this most informing statement, it will be done:

COMPARATIVE SUMMARY OF AVERAGE DAILY COMPENSATION OF RAILWAY EMPLOYEES, BY CLASSES, FOR THE YEARS ENDING JUNE 30, 1914, TO 1892.

Year	General Officers	Other Officers	General Office Clerks	Station Agents	Other Stationmen	Enginemen	Firemen	Conductors	Other Trainmen	Machinists	Carpenters	Other Shopmen	Section Foremen	Other Trackmen	Switchmen, Flagmen and Watchmen	Telegraph Operators and Dispatchers	Employes' Account	Floating Equipment	All other Employes and Laborers
	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
1914* Bureau.....	16.11	6.49	2.53	2.37	1.99	5.28	3.23	4.49	3.11	3.28	2.67	2.37	2.20	1.56	1.72	5.62	4.02	2.22	
1913 ^o Official.....	15.67	6.44	2.51	2.28	1.96	5.20	3.13	4.39	3.04	3.26	2.63	2.31	2.14	1.58	1.70	5.52	3.72	2.15	
1912* Official.....	13.13	5.32	2.50	2.20	1.89	5.00	3.02	4.29	2.96	3.21	2.55	2.24	2.09	1.50	1.70	4.72	3.72	1.10	
1911†	12.99	6.27	2.49	2.17	1.89	4.79	2.94	4.16	2.88	3.14	2.54	2.24	2.07	1.50	1.74	4.42	3.34	2.08	
1910†	13.27	6.22	2.40	2.12	1.84	4.55	2.74	3.91	2.69	3.08	2.51	2.18	1.99	1.47	1.69	3.32	2.22	2.01	
1909†	12.67	6.40	2.31	2.08	1.82	4.44	2.67	3.81	2.59	2.98	2.43	2.13	1.96	1.38	1.73	3.02	2.31	1.98	
1908†	13.11	6.27	2.33	2.09	1.82	4.45	2.64	3.81	2.60	2.95	2.40	2.12	1.95	1.45	1.78	3.02	2.31	1.97	
1907	11.93	5.99	2.30	2.05	1.75	4.30	2.54	3.69	2.54	2.87	2.40	2.06	1.90	1.46	1.87	2.26	2.27	1.92	
1906	11.81	5.82	2.24	1.94	1.69	4.22	2.43	3.51	2.35	2.69	2.28	1.92	1.80	1.36	1.80	2.13	2.01	1.83	
1905	11.74	6.02	2.24	1.93	1.71	4.22	2.38	3.50	2.31	2.65	2.25	1.92	1.79	1.32	1.79	2.02	1.71	1.83	
1904	11.61	6.07	2.22	1.93	1.69	4.10	2.35	3.50	2.27	2.61	2.26	1.91	1.78	1.33	1.77	1.52	1.71	1.82	
1903	11.27	5.76	2.21	1.87	1.64	4.01	2.28	3.38	2.17	2.50	2.19	1.86	1.78	1.31	1.76	2.08	2.11	1.77	
1902	11.17	5.60	2.18	1.80	1.61	3.84	2.20	3.21	2.04	2.36	2.08	1.78	1.72	1.25	1.77	2.01	2.00	1.71	
1901	10.97	5.58	2.19	1.77	1.59	3.78	2.10	3.17	2.00	2.32	2.06	1.75	1.71	1.23	1.74	1.98	1.97	1.69	
1900	10.45	5.22	2.19	1.75	1.60	3.75	2.14	3.17	1.96	2.30	2.04	1.73	1.68	1.21	1.80	1.90	1.92	1.71	
1899	10.03	5.18	2.01	1.74	1.60	3.72	2.03	3.13	1.94	2.29	2.03	1.72	1.68	1.18	1.77	1.83	1.89	1.68	
1895	9.73	5.21	2.25	1.73	1.61	3.72	2.03	3.13	1.95	2.28	2.02	1.70	1.69	1.61	1.74	1.92	1.89	1.67	
1897	9.54	5.12	2.18	1.73	1.62	3.65	2.05	3.07	1.90	2.23	2.01	1.71	1.70	1.61	1.72	1.90	1.86	1.64	
1896	9.19	5.96	2.21	1.73	1.62	3.65	2.03	3.05	1.90	2.22	2.03	1.69	1.70	1.71	1.74	1.90	1.94	1.65	
1895	9.01	5.85	2.19	1.74	1.62	3.65	2.03	3.04	1.90	2.22	2.04	1.70	1.70	1.71	1.75	1.90	1.91	1.65	
1894	9.71	5.75	2.34	1.75	1.63	3.61	2.03	3.04	1.89	2.21	2.02	1.69	1.71	1.18	1.75	1.93	1.97	1.65	
1893	7.94	2.23	1.63	1.65	3.66	2.04	3.08	1.91	2.33	2.11	1.75	1.75	1.22	1.89	1.97	1.96	1.70		
1892	7.62	2.01	1.81	1.63	3.63	2.03	3.07	1.89	2.20	2.08	1.71	1.70	1.22	1.78	1.93	2.07	1.67		

*Pay of general officers in 1914 out of proportion because Bureau returns do not cover hundreds of small roads.

^oDoes not include Class III roads.

†Averages do not include returns for switching and terminal companies.

NUMBER AND PAY OF EMPLOYEES BY GROUPS.

The next summary affords a study of the number and compensation of railway employes by territorial groups in the years 1914 and 1910:

SUMMARY OF NUMBER AND COMPENSATION OF RAILWAY EMPLOYEES IN THE UNITED STATES IN 1910 AND 1914 BY TERRITORIAL GROUPS.

Territory Covered	1914 245,894 Miles Represented		1910 240,830 Miles Represented	
	Number	Compensation	Number	Compensation
Group I	78,775	\$ 66,226,043	84,886	\$ 58,759,512
Group II	369,546	312,807,067	387,713	264,056,130
Group III	248,480	219,213,084	253,832	171,747,062
Group IV	104,109	75,027,036	79,515	45,052,511
Group V	199,110	136,635,707	143,742	87,902,233
Group VI	292,015	236,614,698	323,366	211,516,359
Group VII	56,108	50,869,901	65,464	49,781,295
Group VIII	162,202	121,282,255	162,514	112,816,427
Group IX	68,921	53,977,028	75,350	49,787,692
Group X	119,552	100,416,992	123,038	93,306,085
United States	1,698,818	\$1,373,069,811	1,699,420	\$1,143,725,306
Average per employe		\$749		\$673

Mark that although the number of persons reported is practically the same (602 less) in 1914 as in 1910, compensation was \$229,344,505 more; and 1910 was chosen for the comparison not because of this striking contrast but because it was the last year that the Commission divided the returns by ten territorial groups. While the groups are not strictly comparable, the totals are.

RATIO OF PAY OF EMPLOYEES TO REVENUES.

In the next statement the ratio of the aggregate compensation of railway employes to total operating revenues and expenses is given, together with the telltale ratio of expenses and taxes to revenues since 1895:

SUMMARY SHOWING PROPORTION OF COMPENSATION OF EMPLOYEES TO GROSS EARNINGS AND OPERATING EXPENSES, AND OPERATING RATIO FOR TWENTY YEARS, 1914 TO 1895.

Year	Ratio Compensation of Labor to Gross Earnings	Ratio Compensation of Labor to Operating Expenses	Ratio of Expenses and Taxes to Gross Earnings
1914 Bureau.....	45.14%	62.51%	76.83%
1913 ".....	44.05%	63.47%	73.55%
1912 Official.....	44.05%	63.49%	73.61%
1911 ".....	43.32%	63.10%	72.54%
1910 ".....	41.82%	62.75%	70.06%
1909 ".....	41.00%	62.06%	69.86%
1908 ".....	43.38%	62.33%	73.20%
1907 ".....	41.42%	61.41%	70.63%
1906 ".....	40.02%	60.70%	69.29%
1905 ".....	40.34%	60.40%	69.82%
1904 ".....	41.36%	61.07%	70.91%
1903 ".....	40.78%	61.65%	69.20%
1902 ".....	39.28%	60.58%	67.81%
1901 ".....	38.39%	59.27%	68.06%
1900 ".....	38.82%	60.04%	67.89%
1899 ".....	39.81%	61.04%	68.77%
1898 ".....	39.70%	60.52%	69.09%
1897 ".....	41.50%	61.87%	70.90%
1896 ".....	40.77%	60.39%	70.68%
1895 ".....	41.44%	61.38%	71.18%

If the student will fix 40% in his mind as the ratio for safety in compensation to labor and 70% as the ratio of safety for expenses and taxes to operating revenues, he will understand the perilous situation into which American railways have been forced since 1907.

For the first time on record the operating expenses and taxes have absorbed more than three-quarters of the gross revenues of the railways. The total of 76.83% is made up of general expenses 72.23% and taxes 4.60%. Both of these are unprecedented ratios, and are matters of the gravest concern to the public as well as railway managers.

FOREIGN RAILWAY LABOR AND PAY.

Compiled from the latest information available, more than usually incomplete this year, the next summary gives the number and pay of the leading European railway employes, together with those for Japan:

SUMMARY SHOWING NUMBER OF EMPLOYEES, COMPENSATION AND
AVERAGE YEARLY PAY OF THE PRINCIPAL EUROPEAN COUN-
TRIES AND OF JAPAN.

Country	Miles of Railway	Employees Number	Compensation per Year	Average per Year	Ratio to Revenues
*United Kingdom (1912).....	23,441	‡643,135	\$170,028,613	\$279	27.2
German Empire (1912).....	37,665	743,944	300,723,513	404	36.3
Austria (1912).....	14,185	280,220	92,439,338	330	40.1
Hungary (1912).....	13,303	147,194	44,218,935	300	38.3
Russia (1910).....	41,622	771,938	163,149,009	211	32.7
France (1908).....	24,915	442,709	115,125,400	260	34.4
Italy (State, 1912).....	8,387	148,569	52,657,655	354	45.2
Switzerland (State, 1907).....	2,944	41,973	12,473,926	297	31.9
†Denmark (State, 1914).....	2,333	13,198	4,644,727	352	30.7
Roumania (1913).....	2,200	31,549	7,845,955	249	36.4
Belgium (State, 1911).....	2,926	70,364	17,991,907	256	29.7
Japan (1913).....	5,985	109,983	12,562,020	114	23.0

*Of British railway employees 49,584 are classed as boys, and the compensation does not include administrative staff. †Excludes laborers. ‡Census 1913.

The war has disorganized European railway statistics almost as completely as it has changed the conduct of traffic. It will be observed that Denmark and Japan are the only two countries included in the above table which are up to date. Not only are the Japanese railway statistics up to date but they are printed in English and are the most comprehensive that come to this office.

NUMBER AND PAY OF GERMAN RAILWAY EMPLOYEES.

The official statistics of the *Eisenbahnen Deutschlands* for the year 1912 afford the information for the following statement of the number and pay of the four leading divisions of German railway employees for the calendar year 1912:

SUMMARY SHOWING NUMBER AND PAY OF GERMAN RAILWAY EM-
PLOYEES FOR THE YEAR ENDING Dec. 31, 1912.

Division	Employees Number	Compensation (Total)	Average per Year	Increase over 1907
General Administration.....	33,413	\$ 26,835,458	\$803	\$50
Maintenance and Guarding Road.....	178,726	47,040,315	267	31
Station Service and Train Crews.....	322,463	135,341,543	420	—
Switching Crews and Shops.....	209,352	90,905,197	434	50
Total.....	743,944	\$300,723,513	\$ 404	\$ 52
Per Mile of Line.....	19.87			

These figures in a general way show that German railway employees are paid slightly over half as much as those of American railways, while the highest paid class in Germany does not average as much as our firemen or "other trainmen."

Many of our enginemen receive more per annum than any Japanese official below the rank of the President of the Imperial railways. Germany comes about midway between the pay in America and Japan, so far as compensation in railway employ is concerned.

THE COST OF LIVING.

Inextricably involved in the adjustment of compensation to American railway employes is the cognate question of the cost of living in the United States. It cannot be seriously maintained that the average railway employe individually contributes any more to the efficiency and safety of railway operation than he did a quarter of a century ago. The machinery, the physical system, the organization that we call the railway, has been almost transformed since the Act to Regulate Commerce was passed, but the average railway employe is no more personally effective than he was in 1890. He gets greater results per man because the grade is easier, the engine more powerful, the freight car bigger. The automatic coupler and trainbrake have relieved trainmen of certain physical hardships and the block signal system has contributed to the efficiency and safety of railway operation. But all these are the contributions of capital not of labor, to larger and more economical results.

As nearly as we can estimate these improvements in the physical condition of the railway, they have involved an investment of nearly four billion dollars represented in the difference between \$49,473 and \$65,861 per mile. The mere capital cost of railway living per mile has therefore increased over 33 per cent since 1890. And yet the majority of statisticians and economists persist in referring to a mile of line in 1914 as if it were identical with the same unit of 1890!

The difference between the railways' capital cost of living and the employes' cost of living is that the former has to be made good by the severest economies while the latter is made good at the expense of the former out of revenues. There is another difference—the railway capital cost has provided the better equipment facilities and service, while the labor cost has not added anything to safety or convenience of travel.

The following table issued by the Department of Labor gives the fulcrum of "Retail Prices from 1890 to 1913" upon which railway employes have always rested their claims for higher wages:

RELATIVE RETAIL PRICES OF THE PRINCIPAL ARTICLES OF FOOD

[Average price for 1890-1899=100.0. The relative prices shown in this report for 1890 to 1907 do

Year or Month	Sirloin Steak	Round Steak	Rib Roast	Pork Chops	Bacon, Smoked	Ham, Smoked	Lard, Pure
1890.....	99.3	97.6	98.7	96.5	96.5	98.3	98.5
1891.....	99.7	98.0	99.6	98.8	97.2	99.5	100.0
1892.....	99.6	98.0	99.6	101.1	99.9	101.5	104.4
1893.....	99.4	98.5	98.4	105.0	108.9	107.1	119.2
1894.....	98.1	97.4	97.9	100.9	102.6	101.7	106.4
1895.....	98.7	98.2	97.9	99.7	98.7	98.9	99.9
1896.....	98.8	100.5	99.4	97.8	98.3	96.5	92.1
1897.....	99.6	101.8	100.1	97.5	97.0	98.5	89.0
1898.....	102.1	102.8	102.2	99.7	100.2	97.2	93.5
1899.....	104.4	107.0	106.1	103.2	102.9	100.5	97.1
1900.....	107.1	109.8	109.3	108.9	110.3	106.9	104.9
1901.....	109.4	114.0	112.7	119.0	121.3	111.1	119.6
1902.....	114.6	122.3	118.6	127.8	135.9	120.6	135.6
1903.....	110.6	116.8	117.0	126.1	140.4	122.1	126.0
1904.....	111.0	120.8	117.0	123.1	138.5	119.4	116.3
1905.....	110.6	120.0	116.2	125.0	139.3	119.4	115.8
1906.....	114.2	124.4	120.5	135.9	150.5	127.8	127.3
1907.....	116.7	128.4	123.0	140.9	157.7	131.0	135.5
1908.....	119.9	135.5	126.7	144.6	163.2	133.8	134.3
1909.....	126.1	140.6	132.2	158.7	176.4	142.1	150.5
1910.....	134.0	149.9	137.7	178.3	204.4	159.4	172.9
1911.....	134.9	152.6	138.6	170.3	197.2	155.9	145.3
1912.....	153.0	174.3	155.5	187.8	199.0	160.4	154.3
1912							
January.....	137.1	154.1	140.7	164.0	186.1	151.1	141.2
February.....	137.7	155.3	141.7	157.6	183.5	150.5	141.1
March.....	140.1	158.1	143.6	166.3	183.3	150.9	141.2
April.....	146.9	167.3	150.4	185.6	190.2	155.3	145.6
May.....	157.3	179.9	160.5	188.2	195.5	159.7	152.6
June.....	159.5	184.0	163.8	186.0	196.7	161.3	153.3
July.....	160.4	184.2	162.2	188.5	197.6	162.1	153.3
August.....	162.7	186.9	163.6	205.4	200.3	163.4	157.1
September.....	162.0	184.5	161.7	217.4	208.8	166.3	161.5
October.....	159.9	182.2	160.6	218.6	215.6	168.8	167.0
November.....	156.5	177.5	158.9	196.4	216.0	168.6	167.2
December.....	155.8	178.0	157.8	179.9	214.3	167.0	165.9
1913							
January.....	160.3	183.1	161.6	189.0	210.8	167.4	161.7
February.....	160.8	184.5	162.7	189.4	211.6	169.1	162.3
March.....	165.2	191.2	168.1	203.6	217.2	174.0	165.5
April.....	172.7	199.1	173.4	218.0	222.9	178.1	166.8
May.....	173.6	199.7	173.5	211.9	224.5	179.8	166.7
June.....	175.2	202.5	175.0	211.0	228.5	184.0	166.5
July.....	179.0	207.3	176.9	220.4	235.5	189.6	167.7
August.....	179.3	208.4	176.5	224.5	238.0	192.2	166.9
September.....	174.5	207.7	175.3	234.0	236.0	190.4	169.5
October.....	173.1	205.7	174.8	232.4	233.3	186.7	168.7
November.....	170.7	203.0	173.0	221.8	227.9	182.3	167.8
December.....	169.5	201.3	173.5	210.1	224.6	180.2	167.1

IN THE UNITED STATES, 1890 TO DECEMBER, 1913, BY ARTICLES.

[not exactly agree with those shown in Bulletin 77 because a smaller number of cities is included.]

Hens	Flour, Wheat	Corn Meal	Eggs, Strictly Fresh	Butter, Creamery	Potatoes, Irish	Sugar, Granu- lated	Milk, Fresh	Year or Month
102.8	110.2	101.3	100.3	99.2	109.0	120.8	100.4	1890
104.8	112.4	111.5	105.6	105.7	117.1	103.1	100.5	1891
104.2	104.0	107.7	105.3	106.8	95.4	96.9	100.5	1892
104.3	95.1	104.0	105.5	108.6	111.8	102.6	100.5	1893
98.2	88.3	104.4	97.4	102.0	101.8	95.2	100.3	1894
97.3	89.6	101.0	98.8	97.4	90.6	91.8	99.4	1895
96.1	94.2	92.8	90.3	93.1	78.8	96.2	100.1	1896
92.3	104.7	91.2	94.0	93.7	92.5	94.3	100.0	1897
96.8	106.9	92.9	97.9	95.8	103.9	99.7	99.8	1898
103.4	94.8	92.9	101.6	97.6	98.8	99.6	98.8	1899
99.6	94.6	95.6	99.1	101.2	92.8	103.1	100.0	1900
105.0	94.9	107.6	107.7	103.0	114.0	102.1	101.4	1901
113.6	95.6	123.9	119.4	109.8	116.7	92.8	104.1	1902
119.3	102.1	122.1	125.1	110.2	114.7	93.7	107.4	1903
120.6	118.3	122.9	131.1	108.1	119.0	100.4	107.4	1904
123.6	118.6	123.5	131.3	111.4	109.3	101.8	108.1	1905
128.0	109.3	124.5	134.2	118.3	114.6	97.2	110.0	1906
131.3	118.2	133.5	138.2	127.3	122.2	98.7	118.9	1907
134.9	127.1	142.6	142.8	127.9	129.8	101.3	123.2	1908
145.7	138.1	145.7	154.7	134.3	133.4	100.0	126.2	1909
155.0	135.9	147.9	158.2	139.9	119.5	102.5	131.6	1910
151.6	127.9	147.2	150.2	131.3	157.0	111.1	132.7	1911
158.3	132.9	160.3	162.5	147.4	168.2	108.8	135.6	1912
								1912
151.4	130.1	152.9	202.9	166.9	177.8	115.1	134.8	January
153.4	130.7	153.3	185.1	156.0	185.4	114.5	135.0	February
159.9	131.0	153.7	130.3	145.5	202.1	115.6	134.6	March
163.6	132.7	157.6	125.9	148.4	224.7	111.4	134.0	April
162.2	138.4	163.0	123.8	143.4	211.6	109.1	133.2	May
158.1	139.3	163.7	126.1	133.3	211.6	108.5	132.9	June
157.8	138.4	163.7	135.5	132.9	164.3	106.6	133.2	July
159.3	135.4	164.4	147.8	134.0	146.0	106.1	135.2	August
161.6	132.3	164.3	167.1	141.2	128.0	106.5	135.6	September
160.1	130.3	165.2	186.0	147.9	122.1	105.2	138.2	October
158.1	128.8	162.8	214.4	155.2	121.8	103.7	140.0	November
155.2	126.8	158.5	205.2	163.8	122.9	102.6	140.3	December
								1913
162.4	126.9	156.0	184.8	162.7	124.8	100.7	140.5	January
166.6	127.4	156.1	156.0	163.5	123.6	98.1	140.2	February
172.8	127.2	155.2	131.3	165.2	120.5	93.9	139.5	March
179.7	127.2	155.1	126.4	151.3	119.2	92.7	139.3	April
179.3	127.8	156.0	132.5	144.0	125.8	92.3	138.6	May
170.8	128.6	157.3	140.8	141.3	144.4	92.0	138.4	June
175.6	128.8	157.7	149.4	139.8	174.2	95.2	138.3	July
173.2	127.9	160.0	166.4	141.9	175.2	97.7	138.8	August
174.2	127.8	165.0	191.2	151.3	179.4	99.4	140.3	September
172.1	126.9	168.0	212.4	153.3	173.8	95.9	141.9	October
163.6	126.4	168.9	255.6	154.8	177.2	94.3	143.0	November
165.6	126.1	168.9	250.2	158.8	176.6	94.1	143.0	December

Whether high prices are the cause or the effect of high wages may be left to the unending discussion of the debaters over the priority of the hen or the egg. The fact remains that in America they are coincident, and the successful campaigns of railway labor to force railway revenues to match advancing prices with advancing wages, without authority to advance rates, imperil the solvency and service of the railways.

WHOLESALE PRICES 1890 TO 1912.

As cognate to this study of the relation of wages to the cost of living, we reproduce from the same source the following summary which shows the advance in wholesale prices of pretty much everything whether in domestic purchases or in railway construction, maintenance and equipment:

RELATIVE PRICES OF COMMODITIES BY YEARS, 1890 TO 1913, AND BY MONTHS IN 1913 BY GROUPS OF COMMODITIES.

Year or Month	Average Price 1890 to 1899—100							
	Farm Products	Food, etc.	Cloths and Clothing	Fuel and Lighting	Metals and Im- plements	Lumber and Building Material	House Furnish- ing Goods	Miscel- laneous
1890.....	110.0	112.4	113.5	104.7	119.2	111.0	111.1	110.3
1891.....	121.5	115.7	111.3	102.7	111.7	108.4	110.2	109.4
1892.....	111.7	103.6	109.0	101.1	106.0	102.8	106.5	106.2
1893.....	107.9	110.2	107.2	100.0	100.7	101.9	104.9	105.9
1894.....	95.9	99.8	96.1	92.4	90.7	96.3	100.1	99.8
1895.....	93.3	94.6	92.7	98.1	92.0	94.1	96.5	94.5
1896.....	78.3	83.8	91.3	104.3	93.7	93.4	94.0	91.4
1897.....	85.2	87.7	91.1	96.4	86.6	90.4	89.8	92.1
1898.....	96.1	94.4	93.4	95.4	80.4	95.8	92.0	92.4
1899.....	100.0	98.3	96.7	105.0	114.7	105.8	95.1	97.7
1900.....	109.5	104.2	106.8	120.9	120.5	115.7	106.1	109.8
1901.....	116.9	105.9	101.0	119.5	111.9	116.7	110.9	107.4
1902.....	130.5	111.3	102.0	134.3	117.2	118.8	112.2	114.1
1903.....	118.8	107.1	106.6	149.3	117.6	121.4	113.0	113.6
1904.....	126.2	107.2	109.8	132.6	109.6	122.7	111.7	111.7
1905.....	124.2	108.7	112.0	128.8	122.5	127.7	109.1	112.8
1906.....	123.6	112.6	120.0	131.9	135.2	149.1	111.0	121.1
1907.....	137.1	117.8	126.7	135.0	143.4	146.9	118.5	127.1
1908.....	133.1	120.6	116.9	130.8	125.4	133.1	114.0	119.9
1909.....	153.1	124.7	119.6	129.3	124.8	138.4	111.7	125.9
1910.....	164.6	128.7	123.7	125.4	128.5	153.2	111.6	133.1
1911.....	162.0	131.3	119.6	122.4	119.4	151.9	111.1	131.2
1912.....	171.3	139.5	120.7	133.9	126.1	148.2	113.7	133.2
1913.....	165.8	137.1	123.7	142.2	127.5	151.8	118.1	137.1
1913								
January.....	160.4	132.7	124.2	144.3	132.8	153.1	117.5	134.0
February.....	162.3	133.1	124.7	144.3	132.1	154.1	117.5	134.5
March.....	166.3	132.4	124.7	142.8	130.4	154.8	118.8	134.3
April.....	167.8	132.9	124.6	138.9	129.4	154.7	118.3	135.5
May.....	168.1	132.5	124.1	138.5	129.1	153.2	118.3	135.6
June.....	162.7	133.4	123.6	139.9	127.7	152.8	118.3	136.4
July.....	162.7	135.4	123.7	141.0	126.1	151.2	118.3	138.6
August.....	164.6	136.4	122.9	142.7	126.2	150.3	118.3	138.7
September.....	168.6	141.2	123.5	143.9	126.7	150.7	118.3	140.3
October.....	168.9	144.1	123.5	143.2	125.5	148.9	118.3	139.6
November.....	169.7	143.3	123.7	142.7	123.3	148.9	118.3	138.8
December.....	171.8	144.6	123.2	143.6	120.5	149.7	118.3	137.6

ADVANCING WAGES AND FALLING RATES.

Applying to the wages paid railway employes and the average receipts from rates the same formula by which the Bureau of Labor arrives at the relative rise and fall in the cost of living enables us to present, in the next summary, a striking contrast between what the railways pay and the rates by which they live:

RELATIVE DAILY WAGES OF OTHER TRAINMEN, OTHER SHOPMEN, OTHER TRACKMEN AND ALL OTHER EMPLOYES AND LABORERS, 1892 TO 1914, COMPARED WITH AVERAGE FOR THE EIGHT-YEAR PERIOD, 1892 TO 1899, WITH SIMILAR COMPARISON FOR AVERAGE FREIGHT AND PASSENGER RATES.

Year	Relative Rates of Daily Pay				Relative Receipts per Mile	
	Other Trainmen	Other Shopmen	Other Trackmen	Other Employees and Laborers	Per Ton of Freight	Per Passenger
1892 Official.....	98.9	100.0	103.2	100.4	109.6	104.6
1893.....	100.0	102.3	103.2	102.2	107.1	103.3
1894.....	98.9	98.8	99.9	99.2	104.9	97.7
1895.....	99.5	99.4	99.0	99.2	102.3	100.4
1896.....	99.5	98.8	99.0	99.2	98.3	99.4
1897.....	99.5	100.0	98.1	98.5	97.3	99.6
1898.....	102.1	99.4	98.1	100.4	91.8	97.1
1899.....	101.5	100.6	99.9	101.6	88.3	97.4
1900.....	102.6	101.2	103.2	102.7	88.9	98.3
1901.....	104.7	102.3	104.1	101.6	91.4	99.1
1902.....	106.8	103.5	105.8	102.7	92.3	97.7
1903.....	113.6	108.8	110.8	106.4	93.0	98.7
1904.....	118.3	111.7	112.5	109.4	95.1	98.7
1905.....	120.6	112.3	111.6	110.0	93.4	96.6
1906.....	123.0	112.3	115.1	110.0	91.2	98.3
1907.....	133.0	120.5	123.6	115.4	92.6	99.2
1908.....	136.1	124.0	122.6	118.4	92.0	95.3
1909.....	135.6	124.6	116.7	119.0	93.0	94.0
1910.....	140.8	127.6	124.4	120.8	91.8	95.4
1911.....	150.8	131.0	126.1	125.0	92.4	97.1
1912.....	154.9	131.0	126.9	126.2	90.9	97.8
1913. Bureau.....	160.9	133.9	133.9	129.5	88.7	98.8
1914 ".....	162.8	138.6	134.5	133.4	88.9	96.9

The period 1892 to 1899 was chosen for the base rate because the Commission's figures of daily compensation only date back to 1892.

The four classes represented were chosen for the comparison because they are the largest bodies of railway employees—their yearly compensation amounting to nearly 47% of the total pay roll. Besides, the "other trainmen" represent the more highly organized railway employees; the "other shopmen" are affiliated with outside labor unions and the other two classes represent unorganized labor.

This table more nearly affords a key to the problem "What ails the railways?" than any single summary in this report. With the rate of wages going up and the average of receipts going down, but one result is inevitable.

IV

CAPITALIZATION

By the irony that so widely befogs discussion where vast interests are involved, the one feature of American railways that is entitled to public admiration is most often the subject of scorn, contumely and falsification. That American railways are "grossly over-capitalized" is one of those "lies that will not down" even though the proof of its falsity is as clear and simple as holy writ. That there have been scandals of stock-watering and the issue of bonuses and bonds without full consideration does not admit of doubt. But that American railways as a whole during the last two decades have been over-capitalized, or have ever paid exorbitant returns on capital actually invested, is simply not true.

Today the United States leads the world not only in the length of its railways but in their character and the low cost of their costly construction and equipment. Mark the contrast between the extent and capital cost of American railways and those of Europe:

	Europe	* United States
Miles of line	196,311	241,376
Capital cost	\$25,000,000,000	\$15,531,631,376
Per mile	124,000	64,479

* Commission's figures 1913.

Moreover, every mile of American railway was built with labor costing from twice to three times that paid in Europe and with money for which an average of one per cent more had to be guaranteed. At European rates for labor and money, American railways could have been built under the same financial system by which they were built for approximately \$40,000, or one-third the cost of European railways.

In regard to exorbitant dividends during the twenty-six years the Commission has been compiling the statistics, the net dividends have not averaged anywhere near five per cent on dividend paying stock, although by including duplications the public has been led to believe they averaged over six per cent on dividend paying stock. *On all stock the rate has not averaged three per cent.*

CAPITALIZATION IN 1914.

From the returns of the 443 operating companies reporting to this Bureau, covering 245,894 miles of line, the following summary of capitalization for the year 1914 has been compiled:

SUMMARY SHOWING CAPITALIZATION OF 443 COMPANIES OPERATING
245,894 MILES OF LINE FOR 1914.

Capital Stock	\$7,258,169,015	
Funded Debt	10,259,636,957	
Receivers' Certificates	54,792,163	
Total 203,030 miles Owned		\$17,572,598,135
Rental 42,864 miles, \$123,896,917 at 4½%		2,753,264,000
Total 245,894 miles operated		\$20,325,862,135
Deductions for Railway Stock Owned	\$2,817,861,913	
Deduction for Funded Debt Owned	1,993,534,254	4,811,396,167
Net Capitalization, 1914		\$15,514,465,968
Net Capitalization per Mile Operated		63,094
Net Capitalization per Mile of track (376,033 miles)		41,253

The approximation of the capital value of the leased mileage is corroborated by the figures of the capitalization of non-operating roads given by the Commission in 1912 as \$2,726,083,525.

It is a question whether the "Deductions" should not be increased by adding thereto the stocks and bonds other than those of railway companies, the face value of which in 1914 was as follows:

Other than railway stock owned	\$712,391,760
Other than railway funded debt owned	220,726,558
Miscellaneous securities owned	43,106,193
Total	\$976,224,511

But the market value of these outside securities is so uncertain and their relation to the operation of the railways so negligible that it is thought better to exclude them altogether from what is intended to be an impartial *resumé* of the capitalization of the vast plant irrevocably dedicated to public use.

In 1912, the last year for which the Commission included Class III roads in its computations, it arrived at \$63,535 as the average capitalization per mile of road owned (237,466 miles).

CAPITALIZATION OF CLASS II AND III ROADS.

From the analysis of the capitalization of Class I and II roads, including the non-operating companies, for the year 1913, made by the Commission, the following statement has been condensed:

SUMMARY OF RAILWAY CAPITAL IN 1913, FROM THE OFFICIAL
REPORT.

Capital stock outstanding.....	\$ 8,610,611,327
Funded debt	11,185,514,385
<hr/>	
Total railway capital	\$19,796,125,712
Total stock and funded debt owned.....	\$5,594,490,889
Less items not included in outstanding capital	1,164,837,430
<hr/>	
Balance to be deducted from capital..	4,429,653,459
<hr/>	
Outstanding in hands of the public.....	\$15,366,472,253
Less assigned to "other properties"	36,340,807
Net amount not held by railway companies.....	15,330,131,446
<hr/>	
Average per mile of road (232,765 miles represented)	\$ 65,861

If to the above total for Class I and II roads be added \$201,499,-930 reported as the capitalization of Class III roads in 1912, operating 8,611 miles, we get \$15,531,631,376 as the total of all the railways for 1913, or an average of \$64,346 per mile owned.

The close student cannot fail to notice how nearly these figures tally with those arrived at by the Bureau's returns and computation for 1914 and he may wonder why, with the added investment of a twelvemonth, the capitalization for the preceding year should be so slightly higher.

The explanation is simple. Between the two reports many changes in corporate relations occurred—several of major importance. The merger of the Chicago, Milwaukee & Puget Sound Railway into the Chicago, Milwaukee & St. Paul Railway, by which it was built, extinguished \$100,000,000 capital stock and \$173,525,512 funded debt of the former, with the addition of only \$31,000,000 to the funded debt of the latter. This transaction was the consummation of the plan under which the Chicago, Milwaukee & Puget Sound Railway was financed and built as an extension by the parent company.

Another transaction by which capitalization was reduced in 1914 was the reorganization of the Detroit, Toledo & Ironton Railway Company, which emerged from a receivership with a reduction of \$12,500,000 in Capital Stock and \$14,989,900 in Funded Debt.

Then there was the lease of the Peoria & Eastern Railway to the Cleveland, Cincinnati, Chicago & St. Louis Railway, which extinguished \$10,000,000 Capital Stock and \$13,982,500 Funded Debt of the former road while the funded debt of the latter was only increased \$4,550,000 during the year.

The amount reported to this Bureau as rental for lease of road in 1914 was \$5,403,833 less than in 1913. This decrease was wholly due to the new departure of the Southern Pacific Railway in paying the taxes for its leased roads and deducting the amount from rentals.

These changes not only explain why the capitalization of American railways does not show the increase that might have been expected in 1914, but they illustrate what has been going on since 1835, and account for the amazingly low capitalization of the railways of the United States.

GROSS AND NET CAPITALIZATION SINCE 1889.

In the following summary the gross and net capitalization of the railways of the United States is given by years from the earliest reports to the Commission down to 1914:

SUMMARY OF GROSS RAILWAY CAPITAL, AMOUNT OF RAILWAY SECURITIES OWNED AND NET CAPITALIZATION OF THE RAILWAYS OF THE UNITED STATES, 1914 TO 1889.

Year	Gross Railway Capital	Railway Securities Owned	Net Railway Capital	Net Railway Capital per Mile
1914 Bureau*	\$20,325,862,135	\$4,711,396,167	\$15,514,465,968	\$63,094
1913 Official†	19,796,125,712	4,465,994,266	15,330,131,446	65,861
1912‡	19,752,536,264	4,664,935,614	15,087,600,650	63,535
1911‡	19,208,935,081	4,200,127,511	15,008,707,570	63,944
1910‡	18,417,132,238	4,078,556,298	14,338,575,940	62,657
1909‡	17,487,868,935	13,776,001,202	13,711,867,733	59,259
1908‡	16,767,544,827	3,933,953,317	12,833,591,510	57,201
1907	16,082,146,683	3,161,794,135	12,920,352,548	58,298
1906	14,570,421,478	2,898,480,829	11,671,940,649	54,421
1905	13,805,258,121	2,638,152,129	11,167,105,992	53,328
1904	13,213,124,679	2,501,330,601	10,711,794,078	52,099
1903	12,599,990,258	2,318,391,953	10,281,598,305	51,559
1902	12,134,182,964	2,208,518,793	9,925,664,171	50,961
1901	11,688,147,091	2,205,497,909	9,482,649,182	49,925
1900	11,491,034,960	1,943,050,349	9,547,984,611	51,092
1899	11,033,954,898	1,601,913,167	9,432,041,731	51,215
1898	10,818,554,031	1,521,386,255	9,297,167,776	51,856
1897	10,635,008,074	1,466,936,176	9,168,071,898	51,396
1896	10,566,865,771	1,501,346,914	9,065,518,857	51,141
1895	10,346,754,229	1,447,181,534	8,899,572,695	51,421
1894	10,190,058,678	1,544,653,670	8,646,600,008	50,358
1893	9,894,625,239	1,563,022,233	8,331,603,006	50,293
1892	9,686,146,813	1,391,457,053	8,294,689,760	52,348
1891	9,290,915,439	1,282,925,716	8,007,989,723	50,858
1890	8,984,234,616	1,406,907,001	7,577,327,615	49,473
1889	8,574,046,742	1,151,972,901	7,422,073,841	50,013

*Covers 245,894 miles. See above for net capital of all railways.

†Does not include returns for switching and terminal companies.

‡If railway securities owned in 1908 is correct, the amount for 1909 is about \$300,000,000 below what it should be.

§Class I and II roads only, operating 244,814 miles.

From the above it appears that the capitalization of American railways has increased approximately \$13,000 per mile during the past 26 years. That this is practically all due to the construction of auxiliary track and terminal facilities is proved by the fact that in the meantime capital per mile of all tracks has only increased from \$38,911 to \$41,253, or \$2,342, and the installation of block signals and heavier rails would more than account for that difference.

If when considering per mile assignments the student remembers that "per mile" represents 26% more cost in 1914 than it did in 1889, he will avoid one of the most common errors in comparative railway statistics.

DISTRIBUTION OF CAPITAL BY GROUPS.

The next summary shows the distribution of the gross railway capital by groups according to the Commission's reports for the years 1890, 1900 and 1910, and as reported to the Bureau for 1914. It is impossible to make such assignment for net capitalization because of the inter-ownership of securities among railways operating in different groups:

SUMMARY OF RAILWAY CAPITAL ON JUNE 30, 1890, 1900, 1910 AND 1914 BY GROUPS.

Territory Covered	1890	1900	1910	1914
			240,830 Miles Represented	245,894 Miles Represented
Group I.....	\$ 377,417,302	\$ 472,320,210	\$ 799,627,536	\$ 630,259,406
Group II.....	2,032,242,616	2,337,874,067	3,543,053,383	2,984,237,840
Group III.....	1,309,390,715	1,490,997,662	2,414,370,374	2,201,487,829
Group IV.....	410,704,029	631,863,020	960,183,380	1,262,080,643
Group V.....	742,670,372	903,681,993	1,346,913,136	1,520,563,840
Group VI.....	1,818,588,865	2,024,541,064	3,102,203,094	2,928,766,876
Group VII.....	443,136,450	560,763,313	1,047,244,431	1,251,695,362
Group VIII.....	1,047,274,401	1,395,350,723	2,260,370,943	2,394,080,127
Group IX.....	372,982,285	511,034,132	808,905,131	580,210,866
Group X.....	892,876,385	1,162,599,776	2,134,260,830	1,774,423,033
Total.....	\$9,437,343,420	\$11,491,034,960	\$18,417,132,238	\$17,517,805,872
Less Stocks and Bonds Owned..	1,406,907,001	1,943,050,349	4,078,556,208	4,811,396,167
Net Railway Capital.....	\$8,030,436,319	\$9,547,984,611	\$14,338,575,940	\$12,706,409,705

*Includes \$453,108,804 "other forms of indebtedness" excluded in other years.

†Includes \$36,953,808 assigned to "other properties."

It must be borne in mind that the Bureau figures for 1914 do not include the capitalization of non-operating roads, which in 1913 was reported for Class I and II roads as \$2,684,824,430. In the Bureau's reports this capital is represented by rental paid to the non-operating companies, whose sole "interstate business" consists in distributing it among their stock and bondholders.

NEW RAILWAY CAPITAL IN 1914.

Where on the face of the foregoing tables it appears that railway capital increased less than \$200,000,000 from 1913 to 1914, the new capital invested in them amounted to a much larger sum. As has been explained already, the apparent increase was minimized by mergers and reorganizations and the records of the New York Stock Exchange indicate how this was more than made good by the listing of new securities. According to the *Commercial and Financial Chronicle*, the railroad securities listed for the first time during the calendar year were divided as follows:

Steam Railroad Bonds

For construction, improvements, etc.....	\$238,376,800
For exchange or retirement of other issues.....	106,607,000

Total Bonds	\$344,983,800
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Steam Railroad Stock

For exchange voting trust certificates.....	\$269,384,300
For convertible bonds.....	11,778,100
For construction, acquisitions, etc.....	64,853,700

Total Stocks	\$346,016,100
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Total Stocks and Bonds.....	\$690,999,900
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When the listings for exchange, conversion and retirement are deducted from the total, it will be perceived that less than \$300,000,-000 represents fresh capital investment.

During the calendar year 1914 the railways had recourse to temporary financing to the extent of over \$335,000,000, compared to \$296,000,000 in 1913.

MATURITIES OF RAILWAY OBLIGATIONS.

At the opening of 1915, the railways were confronted by one of the heaviest lists of obligations maturing during the year in their history, aggregating over \$580,000,000. From a study of the subject by *The Annalist* the following summary of the maturities of outstanding railway obligations has been condensed:

In 1915	\$ 581,712,619
In 1916	144,402,238
In 1917	197,192,638
In 1918	82,010,275
In 1919	170,150,432
In 1920	170,540,657
1921 to 1930.....	1,761,397,498
1931 to 1940.....	1,915,790,680
1941 to 1950.....	1,892,257,221
1951 to 1960.....	2,109,755,863
1961 to 1970.....	435,392,916
1971 to 1980.....	6,574,400
1981 to 1990.....	407,614,500
1991 to 2000.....	1,118,483,700
Next century	387,791,780

Total	\$11,381,067,417
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Not until 1965 is there a vacant date of a year waiting the expiration of some railway obligation.

CAPITALIZATION OF FOREIGN RAILWAYS.

With the fact clearly fixed in his mind that the average capitalization of American railways is under \$64,000 per mile, the student's attention is invited to the next statement which gives the capital cost, or cost of construction; of the railways of the principal foreign countries, compiled from the latest official sources:

SUMMARY OF CAPITALIZATION OF PRINCIPAL FOREIGN RAILWAYS.

Year	Country	Miles Line	Capital or Cost of Construction	Per Mile
Europe				
1912	United Kingdom.....	23,441	\$6,501,272,332	\$277,346
1912	German Empire.....	37,665	4,392,651,229	116,662
1910	Russian Empire*.....	41,622	3,508,675,915	84,299
1911	France.....	25,194	3,720,480,021	148,625
1912	Austria.....	14,185	1,724,079,152	121,542
1912	Hungary.....	13,303	949,691,820	71,262
1913	Italy (State).....	8,439	1,334,928,118	158,185
1909	Spain (State).....	9,056	729,929,461	80,461
1908	Portugal.....	1,465	162,385,280	110,830
1911	Sweden.....	8,629	292,036,920	33,600
1913	Norway.....	1,913	84,130,007	43,788
1914	Denmark (State).....	1,216	76,319,972	62,763
1912	Belgium (State).....	2,696	520,777,053	192,770
1910	Netherlands.....	1,980	163,793,304	82,810
1912	Switzerland.....	3,014	362,718,806	122,165
1913	Roumania.....	2,200	198,654,047	90,297
1911	†Serbia.....	551	34,882,135	63,307
1912	Bulgaria (State).....	1,207	58,836,411	48,660
Total Europe including Asiatic Russia.....		197,776	\$24,816,237,018	\$125,480
Other Countries				
1914	Canada.....	30,795	\$1,942,526,809	\$63,060
1912	British India.....	33,484	1,510,187,000	45,101
1910	Argentine Republic‡.....	17,381	868,914,950	49,981
1913	Japan (State).....	5,217	466,335,640	89,337
1914	New South Wales§.....	3,968	298,359,912	75,202
1913	New Zealand§.....	2,810	153,946,641	53,828
1912	Queensland§.....	4,226	135,148,475	31,980
1913	Victoria§.....	3,639	231,657,796	63,519
1914	Western Australia.....	2,966	77,305,659	26,064
1914	South Australia.....	1,815	76,459,667	41,439
1914	United States.....	245,804	15,514,495	63,094

*Includes Asiatic Russia.

†Includes 2.5 miles narrow gauge.

‡About two-thirds 5 ft. 6 in. gauge, remainder 3 ft. 3 1-2 in., or 2 ft. 6 in. gauge.

§New South Wales railways are 4 ft. 8 1-2 in. gauge; New Zealand and Queensland 3 ft. 6 in., and Victoria (all but 121 miles) 5 ft. 3 in.

This table is recommended for the study of all persons who have been misled into thinking American railways are over-capitalized. If they are over-capitalized, what of the state owned roads of Germany, Austria, Italy, Belgium and Switzerland and what of the privately owned roads of Great Britain?

Under government ownership the capital cost of German railways has increased over \$20,000 per mile in 21 years and the capitalization of the Japanese railways has more than doubled since they were acquired by the state in 1908.

RAILWAY INCOME

SHOWING MILEAGE, NET CAPITAL, REVENUES, EXPENSES, TAXES, FROM OPERATION, WITH RATIOS BASED ON REPORTS TO

Year	Miles of Line	Miles of Track	Net Capital (thousands)	Freight Revenue (thousands)	Passenger Revenue (thousands)	Total Revenue inc. Mail, Express etc. (thousands)	Operating Expenses (thousands)
1889	157,759	200,950	\$7,422,074	\$ 642,633	\$254,040	\$ 964,816	\$ 644,706
1890	163,597	208,612	7,577,328	714,464	260,786	1,051,877	692,093
1891	168,402	215,999	8,007,990	736,794	281,179	1,096,761	731,887
1892	171,563	222,351	8,294,690	790,316	286,806	1,117,407	780,907
1893	176,461	230,137	8,331,603	829,054	301,492	1,220,751	827,021
1894	178,708	233,533	8,646,600	699,491	285,350	1,073,361	731,414
1895	180,657	236,804	8,899,573	729,993	252,246	1,075,371	725,720
1896	182,428	240,129	9,065,519	786,616	266,563	1,150,169	772,989
1897	183,284	242,013	9,168,072	772,849	251,136	1,122,089	752,524
1898	184,648	245,333	9,297,168	876,728	266,970	1,247,325	817,973
1899	187,543	250,142	9,432,042	913,737	291,113	1,313,610	856,968
1900	192,556	258,784	9,547,985	1,049,256	323,716	1,487,044	961,428
1901	195,561	265,352	9,482,649	1,118,543	351,356	1,588,526	1,030,397
1902	200,154	274,195	9,925,664	1,207,229	392,963	1,726,380	1,116,248
1903	205,313	283,821	10,281,598	1,338,020	421,705	1,900,846	1,257,538
1904	212,243	297,073	10,711,794	1,379,003	444,327	1,975,174	1,338,896
1905	216,973	306,796	11,167,106	1,450,773	472,695	2,082,482	1,390,602
1906	222,340	317,083	11,671,941	1,640,387	510,033	2,325,765	1,536,877
1907	227,455	327,976	12,920,353	1,823,652	564,606	2,569,105	1,749,515
1908	*230,494	333,646	12,833,592	1,655,419	566,833	2,393,805	1,669,547
1909	*235,402	342,351	13,711,868	1,677,615	563,609	2,418,677	1,599,443
1910	*240,831	351,767	14,338,576	1,925,553	628,992	2,750,667	1,822,630
1911	*246,238	362,824	15,008,708	1,925,951	657,638	2,789,762	1,915,054
1912	*249,852	371,238	15,087,601	1,968,599	660,373	2,842,695	1,972,416
1913	*1244,418	369,580	15,131,191	2,198,931	695,988	3,125,136	2,169,969
1914	||245,894	376,033	15,514,465	2,102,314	695,870	3,041,293	2,196,754

*Figures since 1908, exclude switching and terminal companies.

†Traffic expenses excluded since 1908, amounting to about 2% of gross earnings.

‡Includes only Class I and II roads, i. e., those with revenues of \$100,000 or more.

||Bureau figures more than 98% of traffic represented, include switching and terminal roads.

ACCOUNT 1889-1914

MAINTENANCE AND TRANSPORTATION CHARGES AND NET REVENUES
THE INTERSTATE COMMERCE COMMISSION, 1889 TO 1914

Taxes (thou- sands)	Ratio Exp. and Taxes to Earnings	Net Operat- ing In- come (thou- sands)	Per- centage on Cap- ital	Mainte- nance of Way and Structures (thousands)	Ratio to Earn- ings	Main'te- nance of Equip- ment (thou- sands)	Ratio to Earn- ings	Trans- portation Expenses (thou- sands)	Ratio to Earn- ings	Year
\$27,590	69.66	\$292,520	3.94	\$144,822	15.01	\$106,709	11.06	\$330,915	34.29	1889
31,207	68.74	328,577	4.33	152,719	15.52	114,039	10.14	354,189	33.67	1890
33,280	69.51	333,159	4.16	153,672	14.01	117,048	10.67	384,385	35.05	1891
34,053	69.56	356,457	4.30	164,189	14.01	128,712	10.99	406,729	34.72	1892
36,514	70.79	356,316	4.27	169,253	13.86	136,876	11.21	435,466	35.67	1893
38,125	71.68	303,822	3.51	143,669	13.39	112,894	10.52	394,513	36.75	1894
39,832	71.18	309,819	3.48	143,976	11.92	113,788	9.42	431,149	35.69	1895
39,970	70.68	337,310	3.72	160,345	13.94	133,982	11.65	442,218	38.45	1896
43,137	70.90	326,428	3.56	159,434	14.20	122,762	10.94	432,526	38.55	1897
43,828	69.09	386,215	4.15	173,315	13.89	142,625	11.43	464,674	37.25	1898
46,337	68.77	410,305	4.35	180,411	13.73	150,919	11.49	486,160	37.01	1899
48,332	67.89	477,284	5.00	211,221	14.20	181,174	12.18	529,116	35.58	1900
50,944	68.06	507,185	5.35	231,057	14.54	190,300	11.98	565,266	35.58	1901
54,465	67.81	555,667	5.59	258,382	14.39	213,381	12.36	609,962	35.33	1902
57,849	69.20	585,459	5.70	266,422	14.01	240,430	12.65	702,510	36.95	1903
61,696	70.91	574,582	5.37	261,280	13.23	267,185	13.53	758,239	38.39	1904
63,474	69.82	628,406	5.63	275,046	13.21	288,441	13.85	771,229	37.03	1905
74,785	69.29	714,103	6.12	311,721	13.40	328,555	14.13	836,203	35.95	1906
80,312	70.63	760,278	5.88	343,545	13.23	368,062	14.22	970,953	37.49	1907
84,555	73.20	639,703	4.98	329,373	13.76	368,354	15.39	1,068,252	36.27	1908
90,529	69.86	728,705	5.31	308,450	12.75	363,913	15.05	814,088	33.66	1909
103,795	70.06	824,242	5.74	368,509	13.39	413,110	15.02	916,615	33.32	1910
108,310	72.54	766,398	5.31	366,025	13.12	428,307	15.35	987,382	35.39	1911
120,092	73.61	750,187	4.97	367,448	12.92	450,373	15.84	1,019,035	35.85	1912
127,332	73.51	827,835	5.47	421,232	13.48	511,561	16.37	1,096,253	35.08	1913
139,959	76.83	704,580	4.86	418,621	13.76	531,175	17.49	1,101,266	36.21	1914

V

COST OF CONSTRUCTION

As the years pass and the records of the Interstate Commerce Commission become more exact in detail as the result of more searching requirements, past estimates of the cost of construction of the railways of the United States give place to closer and higher approximations. The gradual perfection of a workable general balance sheet requiring a separate statement of investment prior and subsequent to June 30, 1907, has enabled the Commission to include in its annual report for 1913 the data from which the following statement has been abstracted:

Class I Roads (168,615 miles)—

Investment in road and equipment prior to June 30, 1907..	\$ 9,243,819,097
Investment in road and equipment since June 30, 1907.....	3,508,814,144
Advances for construction.....	413,724,826
Working assets less working liabilities.....	1,171,215,067

Total	\$14,337,573,134
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Class II Roads (18,469 miles)—

Investment in road and equipment.....	\$ 767,707,325
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Non-Operating Roads (36,806 miles)—

Investment in road and equipment.....	\$ 2,798,718,222
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Total (223,890 miles).....	\$17,903,998,681
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Reserved for accrued depreciation.....	\$ 327,846,509
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Net investment	\$17,576,152,173
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As the same authority that furnished the figures for this statement reported 232,677 miles of line owned by the three classes included, exclusive of 8,252 miles for Class III roads and 1,614 miles for switching and terminal roads, it is evident that it falls short of representing the total investment in American railways by the cost of 18,653 miles. Now in 1912 the Commission reported an investment of over \$400,000,000 in the switching and terminal roads alone, and as \$30,000 per mile is a low estimate for the remainder of the omitted mileage, we have at least \$900,000,000 to be added to the above sum. This would make a grand total of \$18,476,152,173 for the 242,543 miles that constituted the physical mileage of the railways in 1913.

Now let us see how these figures compare with the following statement based on returns to this Bureau for the year ending June 30, 1914, in combination with common items from the official report for 1913:

COST OF ROAD AND EQUIPMENT FOR THE YEAR ENDING JUNE 30, 1914, (245,984 MILES REPRESENTED).

Investment in road (203,030 miles owned).....	\$11,083,420,834
Investment in equipment.....	2,882,347,828
Investment undistributed.....	70,256,729
<hr/>	
Total investment reported.....	\$14,036,025,391
Non-operating roads (36,806 miles)*.....	2,798,718,222
Net working assets*.....	1,171,215,067
<hr/>	
Total investment (245,984 miles operated).....	\$18,005,958,680
Less accrued depreciation*.....	327,846,509
<hr/>	
	17,678,112,171

*Amounts for these items taken from preceding table for 1913.

The mileage represented in this table falls over 11,000 miles short of the actual physical mileage of the railways of the United States in 1914. As this mileage includes a large proportion of switching and terminal property, it represents an approximate investment of \$660,000,000, which would bring the grand total up to \$18,338,112,171, or \$138,040,002 below the computation on the preceding page.

Considering the vast sums involved and the independent processes employed in arriving at these totals, their practical agreement goes to confirm the estimate that the railways of the United States today represent an investment of over \$18,000,000,000.

When to this sum is added the appreciation of railway property in all sections of the country, and especially at terminals, during the past eighty years, the present value of American railways cannot fall far short of \$22,000,000,000.

FEDERAL VALUATION OF AMERICAN RAILWAYS.

Although two years have elapsed since Congress yielded to the importunity of the Commission and popular clamor for a physical valuation of the railways, little progress has been made. The process of organization for such a vast undertaking is necessarily

slow and it is not surprising that its sole result so far has been to lengthen the estimate of both the time and the cost of the valuation. Nor is it altogether unexpected that the railways are to be saddled with over three-quarters of the useless expense, now estimated at over \$50,000,000.

While we are waiting for the Commission to put its O. K. on the value of the railways as systems, students of the subject will have to be content with the following state valuations:

SUMMARY OF STATE VALUATIONS.

Steam Railroads of	Cost of Reproduction	Present Value	Capitalisation
Washington (1905)	\$194,057,240	\$175,797,025	\$161,582,000
South Dakota (1908)	106,404,503	91,605,132	109,444,600
Minnesota (1907)	360,961,548	309,706,514	300,027,676
Wisconsin (1909)	296,803,322	240,718,711	225,000,000
Nebraska (1911)	327,190,820	279,169,253	*263,170,000
New Jersey (1911)	374,760,425	285,016,934	*333,568,000
Total	\$1,660,267,853	\$1,382,013,569	\$1,302,792,276

*Commercial valuation in 1904, Census Bulletin 21.

All these valuations, except New Jersey, were admittedly made without taking into account the value of the plant as a going concern, its organization and business connections, etc. In the language of Judge Hook in the Oklahoma case, "An established railroad system may be worth more than its original cost, and more than mere cost of its physical reproduction." Except as a going concern, a railway has no value as a matter of public concern.

The appraisal of the railways of New Jersey appears to have been a most exhaustive attempt to comply with the mandate of the Joint Resolution of the Legislature, approved April 5, 1909, calling for "an inventory and appraisal of railroad and canal property, *including franchise*" in the state. It purports to include the franchise value, but in reality does not, as the commercial value of 1904, which is mainly franchise value, testifies. The allowance of 29.7 per cent for "depreciation on all elements other than Land, Graduation and Grubbing." The state of New Jersey occupies a unique position relative to the railway system of the United States. Figuratively speaking, the value of all railways in New Jersey is franchise value, and the taxable value of all land in New Jersey is due to its dormitory franchise for New York and its terminal franchise for a large part of the railways of the United States.

The report admitted that solidification and settlement of roadbed had an element of cost that must be provided for, but made no provision for this or "strategic value" which constitutes the bed rock which has made the railways of New Jersey the most valuable railways in the United States.

In 1913 the railways of New Jersey paid \$6,823,429 in taxes to the state, indicating a valuation of over \$336,000,000 for taxing purposes. What property is worth for purposes of taxation it is worth for fixing value as an investment.

It may be of interest to compare the above valuations with the following commercial values furnished by Prof. Henry C. Adams, then statistician of the Interstate Commerce Commission, to the Census Bureau and published in its Bulletin No. 21, 1905, together with the taxes paid by the railways in the respective states in 1913 given in the following statement:

	Commercial valuation 1904	Taxes paid 1913	*Tax rate per \$100 estimated true value
Washington	\$ 182,837,000	\$ 3,749,488	0.98
South Dakota	49,646,000	956,241	0.70
Minnesota	466,734,000	4,808,295	0.61
Wisconsin	284,510,000	3,855,843	0.78
Nebraska	263,170,000	2,324,355	0.52
New Jersey	333,568,000	6,823,429	0.70
Total	\$1,580,465,000	\$22,517,651	0.71

*U. S. census.

Observe that the commercial value of 1904 approaches the cost of reproduction total of the state valuations (1905 to 1911), whereas the taxes paid in 1913 bear witness to a true valuation of over \$2,250,000,000, if their assessment has an approximate or legal equality with all other property in the states named.

Applying the Census estimate of the tax rate of 0.74 per \$100 of true value of *all property* in the United States to the taxes paid by the railways in 1914, their value for taxing purposes was approximately \$20,000,000,000.

PENDING STATE VALUATIONS.

California and Kansas are proceeding in a leisurely way with the physical valuation of their intrastate railways. California has established a reproduction valuation of \$22,476,562, or \$31,800 per mile, for 707 miles of its minor railways against a valuation of \$28,344,430, or \$40,000 per mile, by the owners.

The Public Utilities Commission of Kansas thus far has appraised the physical value of the Union Pacific Railroad operating in that state at \$44,120,492, or \$37,157 per mile reproduced new, without allowing anything "for intangible values, such as going values, good will, development cost, franchise, cost of securing business, etc." One section of 68 miles, Kansas City to Topeka, is valued at \$119,694 per mile and another of 88 miles, Junction City to Concordia; Lawrenceburg Junction to Belleville, at \$16,621 per mile.

In South Dakota a Master in Chancery has valued the Chicago & North Western Railway in that state at \$26,301,887, or \$26,876 per mile reproduced new, without allowing anything for going value, etc. Applied to the mileage of the state this would give a total value of \$112,779,200, which may be compared with the 1908 valuation given above.

One of the most significant railway appraisals recently made is that of the Pere Marquette lines by Dean Mortimer E. Cooley of the University of Michigan for the Michigan Railroad Commission. As of date July 1, 1914, Dean Cooley found that the cost to reproduce this property new would be \$96,962,771, or, less depreciation, \$78,545,241. The former figure yields over \$41,700 per mile of line operated against a total capitalization of \$45,600, without allowing anything for going value. Evidently it is not so much over-capitalization as unremunerative rates and fares that keeps the Pere Marquette in the hands of a receivership. The Pere Marquette paid 52.5% of its operating revenues to its employes last year and received only 1.89 cents per mile from the 206,954,347 passengers it carried one mile, and only 6.11 mills for the 1,808,504,819 tons of freight it carried one mile. These are concrete figures that will repay study.

VI

OWNERSHIP OF AMERICAN RAILWAYS

Never in their history was the ownership of American railways more widely distributed in the hands of American investors than at the present time. Returns to this Bureau place the number of shareholders at the date of the last election of directors prior to June 30, 1914, at 456,231, an increase of 49,916 over the number reported for practically the same roads in 1913. The roads reporting represent 203,030 miles of line owned, so we have about $2\frac{1}{4}$ shareholders to every mile of line. Assuming that the same rate prevails for the non-operating roads and the minor roads not reporting, the number of shareholders in all American roads cannot fall far short of 565,000.

The following statement gives the number of shareholders in twenty of the principal roads for the years 1912, 1913 and 1914, in comparison with their returns to the Commission in 1904, when 1,182 companies reported 327,785 shareholders:

GROWTH IN NUMBER OF STOCKHOLDERS IN TWENTY PRINCIPAL AMERICAN RAILWAYS, 1904 TO 1914.

Name of Company	Shareholders			
	1904	1912	1913	1914
Pennsylvania R. R.	44,175	74,002	84,244	90,114
Atchison, Topeka & Santa Fe.	17,823	31,738	36,341	39,825
New York Central & Hudson River	11,781	22,247	20,945	24,194
New York, New Haven & Hartford	10,842	21,948	22,642	26,675
Union Pacific	14,256	21,600	23,120	25,407
Great Northern	383	17,841	18,327	20,623
Southern Pacific	2,424	14,387	15,757	26,999
Northern Pacific	368	13,987	15,612	18,435
Chicago, Milwaukee & St. Paul	5,832	11,819	13,490	18,381
Baltimore & Ohio	7,132	11,414	12,319	15,191
Illinois Central	9,123	9,987	10,545	10,840
Erie	4,309	7,847	7,527	7,527
Chicago & North-Western	4,109	8,564	8,920	9,544
Boston & Maine	7,402	8,106	8,107	8,171
Norfolk & Western	2,911	5,323	6,976	7,291
Delaware & Hudson	3,819	6,483	6,551	6,813
Denver & Rio Grande	2,910	4,928	4,737	4,588
Missouri Pacific	1,861	4,382	4,636	5,577
Chesapeake & Ohio	1,478	4,138	4,525	6,216
Louisville & Nashville	1,672	3,318	3,574	4,546
Total	153,610	304,058	328,895	376,897
Increase since 1904, per cent.				146.7%

It here appears that the number of shareholders in these twenty roads has increased almost two and one-half times in ten years. Moreover, the number reported for these roads exceeds the number reported for all the railways in 1904 by nearly 50,000. On December 31, 1914, the Pennsylvania Railroad Company reported having over 91,500 stockholders, 48% of whom were women. The average holding was 109 shares.

The average holding per shareholder in the United States is about \$15,000, or 150 shares, from which the average yearly return in 1914 was less than \$600, or about equal to the yearly pay of a railway day laborer, with this difference, that the laborer is sure of his share of railway receipts, while the shareholder is not.

It is generally estimated that railway bonds are more widely distributed than capital stock, but there is no data upon which to make a convincing approximation. We do know, however, that railway bonds are so largely held by trustees—including banks, savings banks, life and fire insurance companies, and educational and benevolent institutions—that the indirect ownership in American railway bonds mounts into the millions. It has been computed that the several institutions mentioned hold from \$1,800,000,000 to \$2,000,000,000 of these securities.

In 1913 the Comptroller of the Currency reported that the savings banks having 10,766,936 depositors held \$821,552,244 in railroad bonds and stocks; state banks, \$65,501,389; loan and trust companies, \$297,324,766.

In the United States there are over 34,000,000 life insurance policies, whose holders have a direct interest in the railway securities which form so large a part of the resources of insurance companies.

From all of which it must be obvious that sooner or later there will arise a demand for reasonable and just regulation of railways that will make itself heard.

VII

PUBLIC SERVICE OF THE RAILWAYS

35,129,269,000 passengers carried one mile at.....1.981 cents per mile
288,746,432,000 tons of freight carried one mile at.....7.281 mills per mile

Into these two lines is condensed the final residuum of all railway statistics as related to public service. At one end of each line are the bewildering totals of passengers and freight carried one mile in the year 1914; at the other, down to the infinitesimal fraction of a cent or mill, what the public paid for each mile of service.

The railways of no other country in the world carry any such passenger traffic; the railways of all the rest of the world combined do not carry any such freight traffic. Never before have our railways carried as many passengers one mile and only in 1912 and 1913 have the figures for freight been exceeded.

With such a matchless record of public service, how is it that the railways are not prosperous and all business sags in sympathy with their insufficient revenues?

The figures of average receipts per mile at the ends of the two lines afford the answer. In 1913 these same railways reported an average of 2.008 cents per mile for carrying passengers against 1.981 for 1914. That apparently insignificant drop of 27/1000ths of a cent for 35,129,269,000 passenger miles cost the railways \$9,500,000. And this on top of the fact that on a great proportion of American roads a two-cent average fare scarcely pays operating expenses and taxes.

But it is the average freight receipts that is the seat of the trouble. Only twice before has this average been lower than the figures given above—in 1899 and in 1913. In 1907, the last year when American railways were actually prosperous, the average was 7.59 mills per ton mile. Had that average prevailed in 1914, railway revenues from freight would have been \$89,000,000 more than they were.

When these losses from reduced rates are coincident with higher costs for everything entering into the production of service, only one result is possible—and the railways are experiencing it.

In the accompanying summary the student can study the whole field of railway service, covering four years of the period 1907 to 1914 inclusive. The official figures for 1913 are given as corroborative of the Bureau's independent figures for that year.

COMPARATIVE SUMMARY OF PASSENGER AND FREIGHT SERVICE FOR
THE YEARS ENDING JUNE 30, 1914, 1913, 1912 AND 1907.

Item (m—000 omitted)	1914 Bureau Figures	1913 Bureau Figures	1913† Official Figures	1912† Official Figures	1907 Official Figures
Miles Represented	245,894	242,177	242,657	240,852	227,454
PASSENGER SERVICE					
Passengers carried (m)	1,032,086	1,018,283	1,033,679	1,004,081	873,905
Passengers carried 1 mile (m)	35,129,289	34,447,197	34,575,872	33,132,355	27,718,554
Passengers carried 1 mile per mile of line	142,860	142,235	143,067	136,609	123,250
Mileage of revenue passenger trains (m)	594,510	596,826	593,061	585,853	509,328
Average number of passengers in train	59.2	57.7	55	53	51
Average journey per passenger, miles	34.0	33.83	33.58	33.18	31.72
Passenger car miles (m)	3,369,781	3,331,616	3,320,489	3,235,634	.....
Average passengers per car	10.42	10.34	10.41	10.24	.....
FREIGHT SERVICE					
Number of tons reported carried (m)	1,934,872	2,009,462	2,058,035	1,844,978	1,796,336
Tons carried 1 mile (m)	288,746,432	300,558,334	301,398,752	264,080,745	236,601,390
Tons carried 1 mile per mile of line	1,174,243	1,241,073	1,245,158	1,078,580	1,052,119
Mileage of revenue freight trains (m)	599,981	640,659	643,841	612,345	629,996
Average number of tons in trains	481	469	445	407	357
Typical haul of average railway, miles	140	149	147	143	132
Mileage of revenue mixed trains (m)	33,751	37,052	32,907	37,128	32,111
Total revenue train mileage (m)	1,228,733	1,274,538	1,271,220	1,236,759	1,171,923
Total mileage freight cars (m)	20,830,297	21,002,886	21,034,670	19,466,402	17,122,260
Average freight car miles per day .....	.....	25.4	25.4	25.4	22.7
Average tons per car	13.86	14.31	14.33	13.56	13.82
Total locomotive miles (m)	1,651,247	1,734,411	1,736,371	1,666,352	.....

†Exclude returns from switching and terminal companies, included in 1914, 1913 and 1907.

*Includes 123,210 unclassified.

*Class I and II only.

There are certain features of this table worthy of special attention. It shows that the passenger service continued to grow but more by reason of the length of the journeys than the number of travelers. The trains carried more passengers per train.

On the freight side there was a general falling off. Only the loading of trains was maintained. Where in 1913 the tons carried one mile passed for the first time above the 300 billion mark, in 1914 they receded to 288 billion, accompanied by reduction in train movement.

The effect of trolley competition is shown in the continued increase in the length of passenger journeys. By reference to the succeeding table the student will perceive that since 1895 the average journey has increased from 24 to 34 miles.

PASSENGER TRAFFIC 1914-1888.

Pursuing the analysis of passenger traffic in further detail its most significant units from the traffic and revenue point of view are set forth in the following statement by groups for 1914 with totals since 1888, when the Commission began compiling the data:

SUMMARY OF PASSENGERS CARRIED, PASSENGER MILEAGE, MILEAGE OF PASSENGER TRAINS, AVERAGE PASSENGERS IN TRAINS, PASSENGER REVENUES AND AVERAGE RECEIPTS PER PASSENGER MILE, 1914 TO 1888:

Territory	Passengers Carried (Millions)	Passengers Carried One Mile (Millions)	Mileage Passenger Trains (Millions)	Average Passengers in Train	Average Journey Miles	Passenger Revenue (Millions)	Average Receipts per Passenger Mile (Cents)
Group I....	145	2,850	35	81	19.7	\$ 51	1.789
Group II....	353	8,410	118	71	23.8	145	1.728
Group III....	111	4,602	83	55	41.5	88	1.902
Group IV....	41	1,621	33	48	39.4	35	2.160
Group V....	86	3,062	63	49	35.5	67	2.189
Group VI....	136	6,136	108	56	45.0	119	1.930
Group VII....	17	1,300	24	54	76.2	29	2.208
Group VIII....	55	3,129	57	54	56.6	67	2.124
Group IX....	24	1,197	24	49	50.0	29	2.435
Group X....	64	2,822	48	58	44.0	65	2.320
United States							
1914 Bureau	1,032	35,129	693	59	34.0	\$695	1.981
1913 Official*	1,033	34,575	593	58	33.6	696	2.008
1912 Official*	1,004	33,132	586	56	33.2	660	1.987
1911* "	997	33,201	572	55	33.4	657	1.974
1910* "	971	32,338	549	56	34	628	1.938
1909* "	891	29,109	506	54	33	563	1.928
1908* "	890	29,082	505	54	33	566	1.937
1907 "	873	27,718	509	51	32	564	2.014
1906 "	797	25,167	479	49	31	510	2.003
1905 "	738	23,800	459	48	32	472	1.962
1904 "	715	21,923	440	46	31	444	2.006
1903 "	694	20,915	425	46	30	421	2.006
1902 "	649	19,689	405	45	30	392	1.986
1901 "	607	17,353	385	42	29	351	2.013
1900 "	576	16,038	363	41	28	323	2.003
1899 "	523	14,591	347	41	28	291	1.978
1898 "	501	13,379	334	39	27	267	1.973
1897 "	489	12,256	335	37	25	251	2.022
1896 "	511	13,049	332	39	26	266	2.019
1895 "	507	12,188	317	38	24	252	2.040
1894 "	540	14,289	326	44	26	285	1.986
1893 "	593	14,229	335	42	24	301	2.108
1892 "	560	13,362	317	42	24	286	2.126
1891 "	531	12,844	308	42	24	281	2.142
1890 "	492	11,847	285	41	24	260	2.167
1889 "	472	11,553	277	42	25	254	2.199
1888 "	412	10,101	252	40	24	237	2.349
Increase							
1888 to 1913	150%	247%	139%	47%	42%	109%	
Decrease							15.6%

*Exclusive of switching and terminal companies.

*Class I and II roads only.

When the reader has marked the contrast between the increase of 247% in passenger service and of 193% in passenger revenue from that service during the period covered in the above table, he begins to get an inkling of one side of the many problems confronting railway management. It is only when he contemplates this phenomenon in connection with the fact that everything that contributes to carrying a passenger one mile—labor, rails, fuel, equipment, station facilities, money—costs from 20% to 50% more than it did in 1888, that he realizes what that management is “up against.” Only the increase in passengers per train saves the situation.

Although the official statistician in his first annual report said that an apportionment of expenses between passenger and freight service is one that “must in some manner be made,” and adopted a formula which yielded approximate results, no such apportionment has been attempted since 1893. Under Professor Adams’ formula the cost of passenger service during six years was found to be as follows:

	1888	1889	1890	1891	1892	1893
Average cost of carrying a passenger 1 mile (cents)	2.042	1.993	1.917	1.910	1.939	1.955

Compared with the average passenger revenue throughout the period from 1888 to 1914, it will be perceived how thin the margin upon which passenger traffic has been carried. In fact, it was the discovery that Professor Adams’ formula demonstrated that in four of the ten territorial groups the cost exceeded the revenue per passenger that led to the abandonment of the attempt. Moreover, the averages of cost per passenger mile as officially ascertained in 1893 for the several groups were higher, except in two instances (I and X), than the average revenues for the same groups in 1914.

For statistical purposes the writer has found that dividing expenses between passenger and freight on the basis of locomotive mileage and apportioning the passenger share on the basis of revenue from passengers, mail, express, etc., entering into passenger service yields a fairly satisfactory working formula. When applied to the official returns for Class I and II roads in 1913 this formula yielded an average cost per passenger of 1.813 cents against average receipts of 2.008 cents. Its tendency is to give results under, rather than above, actual costs, and so should be welcome to railway critics. This formula is not applicable to individual roads where conditions

vary widely from the normal for the United States. With them it can be rectified in conjunction with the expenses directly chargeable to passenger traffic.

RECEIPTS FROM MAIL AND EXPRESS.

In the matter of railway mail pay the Commission has utterly failed in its duty to protect railway revenues from the continued raids of the Post Office Department. Only through the approval of the Commission was it lawful for the increase in the weight limit effective January 1, 1914, to be increased from 20 to 50 pounds in certain zones, and from 11 to 20 pounds in others, thereby transferring both freight and express traffic into the post office bags and cars where it does not pay its fair proportion of the cost of transportation.

It is not proposed in this report to go into the detailed testimony that convicts the government of deliberately underpaying the railways from \$15,000,000 to \$30,000,000 a year—this is to be found in the preliminary and final reports of the Bourne Committee. Here we can only trace the effect of the government's policy on railway receipts from mail and express compared with the government's revenues from the mails which the railways enable the government to handle.

In 1914 the receipts of the roads reporting to this Bureau from mail were \$54,892,500 and from express \$75,320,532 against \$50,053,481 and \$78,536,196, respectively, for 1913. The increase of \$4,839,019 in mail receipts is partly offset by the decrease of \$3,215,664 from express, while the balance does not come within many millions of covering the increased service forced on the railways by parcel post freight. It is worthy of note that the mail service receipts reported to the Bureau are only \$588,060 short of the total expenditure for railway service reported by the Post Office Department.

Now let us see how the receipts of the railways for carrying the mail compare with the gross revenues of the Post Office Department and the compensation of railway mail clerks during the period of railway regulation, 1888 to 1914, as set forth in the following statement:

SUMMARY COMPARING RAILWAY MAIL PAY WITH COMPENSATION OF RAILWAY MAIL CLERKS AND POSTAL REVENUES, 1888 TO 1914.

Year	Railway Mail Revenues	Pay of Railway Mail Clerks	Postal Revenues
1888 Official.....	\$19,524,959	\$4,981,366	\$52,695,176
1894 ".....	30,358,190	6,989,449	75,080,479
1899 ".....	36,117,875	8,610,732	95,024,384
1904 ".....	44,699,732	12,095,437	143,528,624
1905 ".....	45,426,125	13,304,994	152,826,585
1906 ".....	47,371,453	14,222,201	167,932,783
1907 ".....	50,378,964	15,248,601	183,585,006
1908 ".....	48,517,563	17,479,504	191,478,563
1909 ".....	49,380,783	18,380,725	203,562,383
1910 ".....	48,913,888	19,120,349	224,128,657
1911 ".....	50,702,625	20,152,904	237,879,823
1912 ".....	50,458,769	20,876,963	246,744,015
1913 ".....	50,053,481	22,815,795	266,610,525
1914 ".....	55,480,560	26,107,051	287,934,565
Increase, 26 years, 1888 to 1914.....	184 %	424 %	416 %
Increase, 10 years, 1904 to 1914.....	24 7%	115.8%	100 5%

This table affords a demonstration of the tyrannous treatment of the railways by the government.

It will be perceived that previous to 1899, the three items ran along on even terms—railway mail pay rather outstripping the others, as it should, by reason of the more exacting demands of the mail service. The rates of increase for the first eleven years were, railway mail pay 85%; compensation of railway mail clerks 73%, and post office revenues 80%.

Now mark what followed. In 1898 political agitators sought to make capital by loud outcries that the railways were being over-paid. In June, 1898, a Congressional Postal Commission was created by act. This was known as the Wolcott-Loud Commission. After a thorough investigation, on January 1, 1901, it reported that the prices paid for mail transportation and postal-car service "were not excessive." But from the date of that report to this day the Department, aided and abetted by Congress, has not ceased to screw down railway pay at every twist while demanding better and more expensive service at every turn.

The result is shown in an increase of less than 25% in railway mail pay in ten years, where the Department's revenue depending on the railway service has increased over 100%. It is a simple calculation, which any honest American school boy or girl can make,

that if mail pay had increased relatively to service as measured by the postal revenues, the railway earnings from mail in 1914 would have been over \$88,000,000, or \$33,000,000 more than they were.

That is one part of the railway case against the government that cannot be gainsaid. The other part does not admit of as clear demonstration, because, as the Bourne Commission has declared, the Department by reason of its inefficient accounting system is not able to give "accurate statistics regarding the extent of its activities, the cost of the service and the revenue therefrom." If we knew the weight or the number of mail pieces handled by the Department annually, we could form some idea of the labor imposed on the carriers. Previous to 1903, the Department gave the number of pieces of mail matter distributed by mail clerks. Between 1888 and 1903 these increased from 6,528,772,060 to 15,999,807,630. But about that time the Department wearied of counting and today we have no corresponding information.

'Tis the same with everything the Department touches. But in the last report of the Second Assistant Postmaster General we find that "the weight of the mails dispatched by sea to foreign countries increased 2,942,060 pounds, or 13.11%, over 1913." It is probable that the weight of domestic mails increased in a greater ratio.

From the same source we also learn that "during the fiscal year (1914) 168 all steel and 15 steel underframe full railway post office cars have been placed in the service; 10 wooden full railway post office cars have been rebuilt and steel underframes applied; 265 all steel, 36 steel underframe and 14 wooden apartment cars have been placed in service." At the close of the year there were 1,356 steel and 615 steel underframe post office and apartment cars in service. The evidence is complete that the railways maintain their end of the mail service at the highest level of efficiency for inadequate pay which the Department plans to reduce.

With an altruism worthy of a better response, Commissioner Harlan, in his opinion in the Five Per Cent Rate Case, said: "We make no suggestion in regard to railway mail pay, as that subject is under investigation by another branch of the government, but it may be assumed that if the compensation for the service is found to be unjust to the carriers, relief will be promptly afforded." The investigation found that the system was grossly unjust, but the Department simply gave the screw another twist.

RAILWAY RECEIPTS FROM EXPRESS.

For the first time since the Commission compiled the figures railway receipts from express in 1914 failed to show an increase over the preceding year. Where under normal conditions they would have shown an increase of approximately \$5,000,000, there was an actual decrease of over \$3,000,000. The course of railway receipts from express in comparison with those from mail for ten years is shown in the following statement:

SUMMARY OF RAILWAY RECEIPTS FROM MAIL AND EXPRESS, YEARS
ENDING JUNE 30, 1904 TO 1914.

Year	Mail		Express	
	Revenues	Percentage of Earnings	Revenues	Percentage of Earnings
1904 Official	\$44,499,732	2.25	\$41,875,636	2.12
1905 "	45,426,125	2.18	45,149,155	2.17
1906 "	47,371,453	2.04	51,010,030	2.19
1907 "	50,378,964	1.94	57,332,931	2.21
1908 "	48,517,563	2.03	53,602,091	2.45
1909° "	49,380,783	2.04	59,647,022	2.47
1910° "	48,913,888	1.78	67,190,922	2.44
1911° "	50,702,625	1.82	70,725,137	2.54
1912 Bureau figures	50,453,760	1.80	73,053,799	2.60
1913 "	50,053,461	1.60	78,536,106	2.52
1914 "	54,892,500	1.80	75,320,532	2.47
Increase per cent.	23.3%		79.9%	

*Excludes switching and terminal companies.

The combined effect of the reduced rates prescribed by the Commission which went into effect in February, 1914, and the parcel post competition is apparent in the following summary of revenues and expenses of the principal express companies, as reported to the Commission:

STATEMENT OF REVENUES AND EXPENSES OF THE PRINCIPAL EXPRESS COMPANIES FOR THE YEAR ENDING JUNE 30, 1914 AND 1913, FROM THE MONTHLY REPORTS.

No.	Item	Grand total (12 companies)	
		1914	1913
1	Gross receipts from operation.....	\$158,891,325	\$168,880,924
2	Express privileges (to railways, etc.).....	79,906,078	83,872,496
3	Operating revenues.....	78,985,248	85,008,426
4	Operating expenses.....	77,221,995	79,215,707
3	Net operating revenues.....	1,763,254	5,792,718
4	Net deficit outside operation.....	33,887	59,932
5	Total net revenue.....	1,729,367	5,732,786
7	Taxes accrued.....	1,491,698	1,379,259
8	Operating income.....	237,669	4,353,527
9	Other income.....	4,501,778	5,533,828
10	Gross income.....	4,739,446	9,887,357
11	Deductions, including interest.....	1,239,724	1,276,465
12	Net corporate income.....	3,499,719	8,610,890
13	Dividends.....	2,986,250	4,679,823
14	Appropriation for reserve.....		6,595
15	Balance to Profit and Loss.....	513,469	3,924,473
16	Dividends from surplus.....	2,577,683	3,172,066
17	Profit and Loss account credit to balance sheet after deductions for year.....	\$27,632,630	\$60,165,378
18	Miles covered.....	305,690	301,240

The vital item in this account is No. 8, which shows a reduction in operating income from \$4,353,527 to \$237,669.

Save for the two Canadian companies included, there would have been a net operating deficit in 1914.

Item number two shows where the railways were "hit" by the decrease in express revenues from operation. This practically agrees with the loss shown on another page. The difference is due to the inclusion of Canadian companies and the fact that the express companies have contracts with steamboat lines, etc.

This statement does not disclose the fact revealed in other reports that approximately 70% of the entire operating cost of express business goes to labor.

THE FREIGHT TRAFFIC.

Leaving the traffic which for a majority of American railways is so nearly unremunerative as to require constant nursing by expensive equipment, stations and advertising, the reader comes to the traffic that pays the freight for all other branches of railway service, contrary to all principles of just economics and the law as laid down by the Supreme Court. In the language of Prof. Emory R. Johnson, "social welfare is more dependent upon cheap and unfettered movement of commodities than upon inexpensive and speedy means of travel." And today social welfare in the United States has been advanced beyond that known in other countries by the free movement of commodities at rates below those prevailing elsewhere in the civilized world.

This is why the following summary and that which follows it present the truest and fullest vindication of the principles and practices of American railways. By their fruits they are justified.

SUMMARY OF FREIGHT MILEAGE, REVENUE AND RECEIPTS PER TON MILE, 1901 TO 1914.

Year	Number of Tons Carried One Mile	Increase over Preceding Year (Per Cent)	Freight Revenue	Increase over Preceding Year (Per Cent)	Receipts per Ton-Mile (Mills)
1901 Official.....	147,077,136,040		\$1,118,543,014		7.50
1902 ".....	157,289,370,056	6.9	1,207,228,845	7.9	7.57
1903 ".....	173,221,278,993	10.2	1,338,020,026	10.8	7.63
1904 ".....	174,522,089,577	0.7	1,379,002,693	3.0	7.80
1905 ".....	186,463,109,510	6.9	1,450,772,838	5.2	7.66
1906 ".....	215,877,551,241	15.7	1,640,386,655	13.1	7.48
1907 ".....	236,601,390,103	9.6	1,823,651,998	11.2	7.59
1908* ".....	218,381,554,802	D 7.7	1,655,419,108	D 9.2	7.54
1909* ".....	218,802,986,929	0.2	1,677,614,678	1.3	7.63
1910* ".....	255,016,910,451	16.6	1,925,553,036	14.8	7.53
1911* ".....	253,783,701,839	D 0.4	1,925,950,837	.0	7.57
1912 ".....	264,080,745,058	4.0	1,968,598,630	1.6	7.44
1913*⊙ ".....	301,398,752,108	14.0	2,198,930,565	12.3	7.29 (a)
1914 Bureau.....	288,746,432,000	D 4.2	2,102,314,730	D 4.4	7.28
Thirteen years' increase.....		96.3%		88.0%	

*Excludes figures of switching and terminal companies.

⊙Class I and II only.

(a) The Bureau's figure in 1913 was 7.27 mills.

D Decrease.

Aside from its demonstration of the enormous volume and remarkable cheapness of the freight traffic of American railways, this table affords proof of the check in its growth since 1907. In the six years preceding 1907 it increased 61%, or at the rate of 8% a year. In the seven years 1907 to 1914, it increased only 22%, or slightly over $2\frac{1}{2}\%$ a year. It will be noticed also that three times since 1907 the letter D marks a temporary recession. When experts take the stand before the Commission and declare that American railways are poor because they are over-equipped, they might be pointed to the increases shown in the above table for 1903, 1906, 1907, 1910 and 1913, and asked what would have been the condition if the roads had been equipped with barely sufficient facilities to handle the traffic of the year before. This table proves that the railways of the United States must perforce maintain their facilities by a standard 20% above the current year's demands. Otherwise they will be caught napping as they were in 1906-7. Are they so equipped now? is the question that causes thoughtful railway managers to pray the Lord to temper returning prosperity to their capacity to handle it.

FREIGHT TRAFFIC BY GROUPS AND SINCE 1888.

In the next statement is presented a comprehensive review of the freight traffic in 1914 by original territorial groups of the Interstate Commerce Commission and the totals of the essential assignments since 1888.

SUMMARY OF FREIGHT TRAFFIC SHOWING ESSENTIAL ASSIGNMENTS
BY GROUPS IN 1914 AND YEARLY SINCE 1888.

Territorial Division	Tons Carried (Millions)	Tons Carried One Mile (Millions)	Mileage Freight Trains (Millions)	Average Tons in Train	Average Haul per Ton (Miles)	Freight Revenue (Millions)	Receipts per Ton-Mile (Cents)
Group I	74	6,981	23	303	94	\$ 79	1.133
Group II	549	71,198	118	601	129	459	.642
Group III	455	56,880	102	518	125	329	.581
Group IV	121	24,585	41	605	204	134	.546
Group V	149	25,478	78	325	171	206	.807
Group VI	286	47,177	108	438	165	359	.762
Group VII	44	10,336	20	530	235	93	.902
Group VIII	107	21,659	54	402	202	198	.913
Group IX	58	7,976	26	304	138	83	1.088
Group X	91	16,476	30	539	180	164	
United States							
1914 Bureau	1,935	288,746	600	481	149	2,102	.728
1913 Official (a, b)	2,058	301,399	644	446	147	2,199	.729
1912 (a)	1,845	264,080	612	407	144	1,989	.744
1911 (a)	1,781	253,783	626	383	143	1,925	.757
1910 (a)	1,849	255,016	635	380	138	1,925	.753
1909 (a)	1,556	218,802	568	363	142	1,677	.763
1908 (a)	1,532	218,381	587	352	144	1,655	.754
1907	1,796	236,601	629	357	132	1,823	.759
1906	1,631	215,877	594	344	132	1,646	.748
1905	1,427	186,463	546	322	130	1,450	.766
1904	1,309	174,522	535	308	133	1,379	.780
1903	1,304	173,221	526	311	133	1,333	.763
1902	1,200	157,289	499	296	131	1,207	.757
1901	1,089	147,077	491	281	135	1,118	.750
1900	1,081	141,596	492	270	130	1,049	.729
1899	943	123,667	(c) 507	243	131	913	.724
1898	863	114,077	503	226	132	876	.753
1897	728	95,139	564	204	130	772	.798
1896	765	95,328	479	198	124	786	.806
1895	696	85,227	449	189	122	729	.839
1894	638	80,335	446	179	125	699	.860
1893	745	93,588	506	183	125	829	.878
1892	706	88,241	485	181	124	799	.898
1891	675	81,073	446	181	120	736	.895
1890	636	76,207	435	175	119	714	.941
1889	539	63,727	383	179	127	644	.922
1888	480	61,329	348	176	128	613	1.001
Increase							
1888 to 1913	285%	371%	70%	173%	16%	243%	D37.3%

(a) Excludes figures of switching and terminal companies.

(b) Classes I and II only.

(c) Includes 75% of mixed train mileage, that being the practice prior to 1900.

D = Decrease.

The average receipts for 1914 per ton mile—7.28—shown in this table, is one-thousandth of a cent higher than that reported by the Bureau for 1913 and a like decimal below the average reported officially for Class I and II roads that year. With the exception of last year, one has to go back to 1899 to find a lower average. It was the attempt of the railways to stem the rapids of falling rates in 1900 that aroused the shippers and politicians to the campaign that gave the Commission the control of rates which has been misinterpreted to mean for reductions only.

TON MILE RATES IN FOREIGN COUNTRIES.

The following table gives the average receipts per ton mile for the countries named, so far as the same is ascertainable from the latest official reports:

	Receipts per Ton-Mile Cents		Receipts per Ton-Mile Cents
United Kingdom (1912)	2.39	Denmark (1914)	2.33
Germany (1912)	1.37	Holland (1911)	1.36
France (1911)	1.30	Belgium (1912)	1.13
Russia (1910) .....	.94	Switzerland (1912)	2.91
Austria (1912)	1.50	Spain (1909)	2.43
Hungary (1912)	1.34	New South Wales* (1914)	1.74
Bulgaria (1912)	1.53	South Australia (1914)	1.84
Sweden (1910)	1.53	Japan (1913) .....	.87
Norway (1913)	1.64	Canada (1913) .....	.76

*Omits terminal receipts, 23.01 cents per ton, 1913.

The British rate is computed by a formula adopted by the London *Statist*. It includes a considerable "collected and delivered" traffic, which, however, is offset by a large traffic carried in "owners' wagons," for which haulage only is charged. Mineral traffic in Great Britain constitutes over 70% of the "goods" traffic against about 50% in the United States. For other information regarding foreign roads the reader is referred to the tables at the end of this pamphlet.

PROPORTION OF COMMODITIES MOVED.

The next summary, giving the relative tonnage of the various classes of freight moved, will prove interesting in itself and for its bearing on the average receipts per ton mile.

SUMMARY OF TONNAGE AND PROPORTION OF DIFFERENT CLASSES OF COMMODITIES MOVED, 1911 AND 1914.

Class of Commodity	1911 Official		1913 Official Class I and II		1914 Bureau	
	Tonnage Reported as Originating on Line	Per Cent of Aggre- gate	Tonnage Reported as Originating on Line	Per Cent of Aggre- gate	Tonnage Reported as Originating on Line	Per Cent of Aggre- gate
Products of Agriculture.....	85,566,053	8.85	106,067,317	9.27	106,810,090	10.75
" Animals.....	23,763,262	2.46	26,446,382	2.31	28,527,277	2.87
" Mines.....	539,255,980	55.75	650,940,253	56.86	515,035,916	51.83
" Forests.....	108,506,272	11.22	112,079,164	9.79	110,198,351	11.09
Manufactures.....	135,175,536	13.97	165,532,035	14.46	152,221,117	15.32
Merchandise.....	36,519,321	3.77	42,520,369	3.71	43,050,439	4.33
Miscellaneous.....	38,447,567	3.98	41,254,783	3.60	37,862,104	3.81
Total.....	967,233,991	100.00	1,144,840,303	100.00	993,705,294	100.00

Through a succession of years since 1901, statements like the preceding afford the percentages for the succeeding summary showing how the proportion of commodities carried fluctuates yearly and yet preserves the same general proportion to the whole:

SUMMARY SHOWING PERCENTAGE OF FREIGHT TRAFFIC MOVEMENT BY CLASSES OF COMMODITIES, 1901 TO 1914.

Year	Low Rate Freight Percentage of Aggregate					High Rate Freight Percentage of Aggregate			
	Prod- ucts of Agri- culture	Ani- mals	Mines	Forest	Total	Manu- factures	Mer- chan- dise	Miscel- laneous	Total
1901 Official.....	10.76	2.91	51.67	11.67	77.01	13.75	4.16	5.08	22.99
1902 ".....	9.23	2.64	52.36	11.64	75.87	14.49	4.37	5.27	24.13
1903 ".....	9.56	2.63	51.56	11.67	75.42	14.39	4.69	5.50	24.58
1904 ".....	9.59	2.74	51.56	12.53	76.42	13.41	4.83	5.34	23.58
1905 ".....	9.03	2.54	53.59	11.24	76.40	13.60	4.32	5.68	23.60
1906 ".....	8.56	2.32	53.09	11.24	75.21	14.81	4.06	5.92	24.79
1907 ".....	8.62	2.29	53.39	11.38	75.68	15.41	3.89	5.02	24.32
1908 ".....	8.74	2.46	55.72	11.35	78.27	13.15	4.04	4.54	21.73
1909 ".....	8.92	2.49	55.60	11.75	78.76	13.15	4.11	3.94	21.24
1910 ".....	8.13	2.10	56.23	11.67	78.13	14.42	3.69	3.76	21.87
1911 ".....	8.85	2.46	55.75	11.22	78.28	13.97	3.77	3.98	21.72
1912 ".....	9.09	2.50	56.75	10.03	78.37	14.02	3.84	3.77	21.63
1913* ".....	9.27	2.31	56.86	9.79	78.23	14.46	3.71	3.60	21.77
1914 Bureau.....	10.75	2.87	51.83	11.09	76.54	15.32	4.33	3.81	23.46

*Class I and II roads only.

It will be perceived that the proportion of minerals carried is the lowest since 1904; while that of manufactures is the highest, except for 1907, in the table.

The relatively large proportion of high rate freight adds increased significance to the low level of average receipts per ton mile. It indicates that with anything like the percentage of coal movement of last year the average per ton mile receipts in 1914 would have been the lowest in the history of American railways.

TRAFFIC AND RECEIPTS FROM SELECTED COMMODITIES.

The next summary shows the quantities, ton mileage, revenues and average receipts per ton mile of certain commodities for which the Commission requires special information.

SUMMARY OF SELECTED COMMODITIES FOR THE YEAR ENDING JUNE 30, 1913; 151,941 MILES REPRESENTED.

Commodity	Freight Carried in Carload Lots	Ton-Mileage of Freight Carried in Carload Lots	Revenue from Freight Carried in Carload Lots	1913 Average Receipts per Ton per Mile from Same (Cents)	1910 Average Receipts per Ton per Mile from Same (Cents)
Grain.....	46,917,607	11,612,305,040	\$ 67,433,380	0.581	0.630
Hay.....	7,044,526	1,166,390,207	11,726,330	1.005	1.019
Cotton.....	5,891,197	1,202,820,272	21,383,215	1.693	1.823
Live Stock.....	12,402,273	2,500,053,863	32,575,133	1.259	1.217
Dressed Meats.....	2,713,589	875,769,506	8,449,390	.965	.994
Anthracite Coal.....	30,300,005	6,672,902,520	38,576,092	.578	.589
Bituminous Coal.....	300,990,206	40,780,224,791	182,191,461	.447	.495
Lumber.....	91,740,437	16,168,142,054	113,292,792	.701	.734

Observe that there was a substantial decrease in the average receipts per ton mile for every commodity except live stock and dressed meats. The decrease was especially marked in the case of grain, bituminous coal and lumber, which constitute over 80% of the traffic carried.

The average haul for the respective commodities was, grain 247 miles; hay 166; cotton 214; live stock 209; dressed meats 322; anthracite coal 170; bituminous coal 135, and lumber 176.

RATES IN NEW SOUTH WALES.

For purposes of comparison with some of the rates in the above statement, the next summary gives the haul and average rates for certain commodities for the government railways of New South Wales:

STATEMENT OF AVERAGE HAUL AND TON MILE RECEIPTS ON THE RAILWAYS OF NEW SOUTH WALES FOR YEARS ENDING JUNE 30, 1913 AND 1914.

Commodity	1913		1914	
	Average Haul (Miles)	Receipts per Ton Mile (Cents)	Average Haul (Miles)	Receipts per Ton Mile (Cents)
Coal, Coke and Shale.....	28.12	.94	26.39	.98
Firewood.....	28.09	1.60	30.59	1.48
Grain and Flour.....	239.74	.78	252.57	.76
Hay, Straw and Chaff.....	199.89	.74	206.03	.76
Wool.....	304.80	3.86	304.13	3.86
Live Stock.....	266.63	1.96	251.16	2.20
General Merchandise (including all other Goods).....	95.04	2.86	96.69	2.82
Total.....	75.60	1.76	80.45	1.74

These figures are especially interesting for comparison because industrial conditions in Australia are more nearly on a par with those in the United States than in other countries where state ownership of railways prevails.

To the average receipts per ton mile in New South Wales approximately one-third of a cent should be added to cover terminal charges, not included in the above statement but included in the American average.

VIII

EARNINGS AND EXPENSES

In presenting the first summary under this title, the Bureau follows the correct theory enunciated by Professor Adams when Official Statistician and eliminates all intercorporate interests, the same as if the government operated all the railways as a single system:

INCOME ACCOUNT OF THE RAILWAYS IN THE UNITED STATES, CONSIDERED AS A SYSTEM FOR THE YEARS 1914 AND 1913.

Item	Amount	
	1914 Bureau's Figures	1913 Official Figures (b)
Miles Represented.....	245,894	242,557
Operating Revenue:		
From Passengers.....	■ 695,870,023	■ 695,987,817
From Freight.....	2,102,314,730	2,198,930,565
From Mail.....	54,802,500	50,789,212
From Express.....	75,320,532	79,717,266
Other Revenue from Operation.....	112,895,796	99,710,938
Total Revenues from Operation....	\$3,041,293,581	\$3,125,136,798
Operating Expenses:		
Maintenance of Way and Structures..	\$ 418,621,040	■ 421,232,395
Maintenance of Equipment.....	531,175,740	511,972,415
Traffic Expenses.....	63,470,997	62,826,186
Transportation Expenses.....	1,101,266,237	1,095,909,503
General Expenses.....	82,220,458	78,028,425
Taxes.....	139,959,071	127,331,060
Total Expenses and Taxes.....	2,336,713,543	2,297,300,884
Net Revenues from Operation.....	704,580,038	827,834,914
Net Revenue from Outside Operations..	(a) 1,845,357	2,028,334
Total Operating Income.....	\$ 702,734,681	\$ 829,863,248
Disposition:		
Interest on Funded Debt.....	■ 390,045,667	404,817,955
Interest on Unfunded Debt.....	36,310,022	31,191,623
Rent paid for lease of road.....	123,896,917	133,903,011
Additions and Betterments Charged to Income.....	29,246,627	46,022,688
To Sinking Fund and Other Reserves	9,990,290	13,681,525
Deficits of Weak Companies and Other Deductions.....	57,617,179	(c) 9,160,206
Total Deductions.....	647,115,702	640,147,093
Income Available for Dividends and Surplus.....	\$ 55,618,979	\$ 189,716,240

(a) Deficit.

(b) Class I and II roads only.

(c) No allowance for deficits of weak companies over \$40,000,000.

In the face of this exhibit, disposing of every cent of railway revenues derived from the operations over which the Commission has authority, and showing a balance of only \$55,618,979 available for dividends and surplus, the Commission issued a statement to the press, March 31, 1915, saying:

The amount of dividends declared during the year (1914) by both operating and non-operating companies represented in this statement was \$451,263,197, being equivalent to 7.97 per cent on dividend paying stock.

Never in all the years the Commission has been making these misleading statements of the amounts paid in dividends by American railways was anything more disingenuous issued by its accounting department.

Naturally this is the only part of the "Abstract for the Press" that gets publicity, although the statement goes on to say that the increase of \$82,656,875 in dividends declared during the year is principally accounted for by *increased dividends* declared by the Union Pacific Railroad and the Central Pacific. It is common knowledge that these so-called *increased dividends* were the distribution of accumulated profits. In the case of the Union Pacific it took the form of dividing \$50,000,000 Baltimore & Ohio common and \$26,000,000 preferred stock from the Union Pacific's intercorporate holdings among its stockholders. As a matter of fact, and by reason of this distribution, the regular dividend of the Union Pacific was reduced from 10 to 8%.

The Commission's statement of March 31st goes on to say that of \$379,865,024 dividends declared by the operating roads, \$162,760,634 was declared out of surplus and of \$71,398,173 declared by the non-operating roads \$34,170,961 was also out of surplus. So we have nearly \$200,000,000 (\$197,931,595) of the alleged \$451,263,197 dividends in 1914, "declared out of surplus."

At least two-thirds of all this is merely juggling with dividends, which are paid out of one railway treasury into another. The only sum which by any possibility reached the pockets of the public out of transportation income in 1914 was the above balance of \$55,618,000 on the year's operations and \$37,227,212 dividends declared by non-operating roads out of the rentals paid to them.

OTHER INCOME

It is impossible to tell what amount of the interest and dividends disbursed by non-operating roads finds its way back into the "Other Income" accounts of the operating roads. The total receipts of the roads reporting to the Bureau in 1914 from this source was \$290,525,638, nearly all of it being interest and dividends accruing through intercorporate ownership.

DISTRIBUTION OF TRANSPORTATION REVENUES.

In order that the reader may follow the distribution of the gross revenues of the railways through the various channels by which they are restored to the source from which they came, the next summary gives the several items in greater detail than they are shown in the income account, in comparison with similar items for 1913 and 1907:

SUMMARY SHOWING THE DISTRIBUTION OF GROSS EARNINGS OF 245,894 MILES OF OPERATED LINE IN 1914, COMPARED WITH THE PERCENTAGES FOR 1913 AND 1907.

Item	Mileage		Gross Earnings		
	1914.....	245,894	\$3,041,293,581		
	1913.....	247,177	3,118,929,318		
	1907.....	227,671	2,589,105,578		
	Amount 1914	Per Cent of Gross Earnings			
		1914	1913	1907	
Operating Expenses:					
Maintenance of Way and Structures.....	\$418,621,040	13.76	13.40	13.27	
Maintenance of Equipment.....	531,175,740	17.47	16.39	14.22	
Traffic Expenses.....	63,470,997	2.09	2.01		
Transportation Expenses.....	1,101,266,237	36.21	35.16		37.50
General Expenses.....	82,220,458	2.70	2.45		2.54
Total.....	\$2,196,754,472	72.23	69.41		67.53
Disposition of Same:					
Pay of Employees.....	\$1,373,069,811	45.14	44.05		41.42
Fuel for Locomotives.....	243,524,752	8.01	7.98		7.74
Oil, Water and Supplies for Locomotives.....	25,813,044	.85	.66		.88
Loss injuries and Damage.....	75,324,514	2.48	2.26		1.83
Material for Way and Structures.....			3.60		
Depreciation of Equipment.....			1.70		
Supplies and Expenses.....			2.02		
Stationery and Printing.....			.66		
Law Expenses.....	479,022,351	15.75	.35		15.66
Advertising.....			.30		
Insurance.....			.25		
Miscellaneous, including Hire and Rent of Equipment, etc.....			5.58		
Total Expenses.....	\$2,196,754,472	72.23	69.41		67.53
Taxes.....	139,959,071	4.60	4.14		3.10
Rentals of Leased Roads.....	123,896,917	4.07	3.92		4.69
Interest on Funded Debt and Current Liabilities.....	426,355,689	14.02	13.04		13.14
Deficit of Weak Companies(a).....	57,617,179	1.90	1.30		.19
Betterments and Reserves.....	39,245,917	1.29	2.22		1.50
Other Deductions.....			1.10		1.07
Dividends and Surplus.....	55,618,070	1.83	4.92		8.78
Total.....	\$3,039,448,224	99.94	100.05		100.00
Net Deficit Outside Operations.....	1,845,357	.06	(b).05		
Gross Operating Revenues.....	\$3,041,293,581	100.00	100.00		

(a) Deficits of weak companies actually \$58,897,898 leaving nothing for other deductions

(b) Net profits outside operations, 1913

The most cursory examination of this statement suffices to demonstrate that after paying operating expenses, taxes, interest and rentals out of the revenues from transportation in 1914 there was less than 5% of those revenues left to provide for deficits of weak companies, reserves for betterments, sinking funds, etc., dividends and surplus. If this sum, amounting to a little over \$152,000,000, were all available for dividends, it would have paid barely 2% on the capital stock of the 443 companies reporting to this Bureau. But the sums required to maintain the companies operating at a loss, for betterments and sinking funds, etc., are real requirements, vital to the continued public service of the railways. When they are taken care of, scarcely 2% of the revenues from operation remains for dividends and surplus, or considerably less than 1% on the capital stock of the operating railways of the United States.

Moreover, and this is a very important feature of the situation, the \$426,355,689 paid on account of "Interest on Funded Debt and Current Liabilities" in 1914 was less than 4% on such indebtedness.

As the railways have no income that amounts to anything beyond what is derived from operation, the absurdity and injustice of the Commission's statements as to dividends declared are apparent.

DISTRIBUTION OF THE ITEM OF RENT.

One item in the above statement, that of "rental for leased roads," can be traced one step further toward its final distribution. The companies receiving this, in the language of Professor Adams, in his first official statistical report, "*maintain their corporate existence merely for the purpose of receiving and disbursing rental paid by lessee roads.*" How they disburse it is shown in the following statement issued to the press by the Interstate Commerce Commission:

CONDENSED INCOME AND PROFIT AND LOSS ACCOUNTS OF LEASED
ROADS FOR THE YEARS ENDING JUNE 30, 1914 AND 1913.

Income Account	1914	1913
Gross Income from Lease of Road	\$110,670,101	*\$124,332,275
Taxes Accrued.....	940,055	(a) 5,326,536
Net Income from Lease of Road	\$109,730,046	\$119,005,739
Other Income.....	6,139,973	7,777,635
Gross Corporate Income	115,870,019	126,783,374
Interest and Similar Deductions from Gross Income.....	64,561,479	68,568,734
Net Corporate Income	51,308,540	58,214,640
Disposition of Net Corporate Income:		
Dividends Declared from Current In- come	37,227,212	38,845,422
Appropriations for Additions and Bet- terments.....	2,271,026	2,140,855
Miscellaneous Appropriations.....	1,178,765	1,334,011
Total	40,677,003	42,320,288
Balance to Credit of Profit and Loss	10,631,537	15,894,352
PROFIT AND LOSS ACCOUNT		
Credit Balance on June 30, 1913 and 1912.	31,327,523	57,158,330
Credit Balance for Year 1914 and 1913 from Income Account.....	10,631,537	15,894,352
Total	41,959,060	73,052,680
Dividends Declared out of Surplus	34,170,961	2,250,069
Difference	7,788,099	70,802,611
Other Profit and Loss Items—Debit Bal- ance	15,524,080	(b) 39,475,088
Balance Debit June 30, 1914 and 1913, Carried to Balance Sheet.....	7,736,881	(c) 31,327,523

(a) In 1913 Taxes were paid by Lessor Companies, largely discontinued in 1914.

(b) This item reduced from \$44,929,731 in official report to conform to credit balance carried to 1914. The "credit balances" never ~~from~~ from year to year.

(c) Credit.

It will be observed that the gross rental received and disbursed by these non-operating roads does not coincide with that paid by the operating roads. There are several reasons for the discrepancy—the chief being that the latter are themselves often lessors.

It will also be perceived that the sums paid in interest and dividends and similar deductions in 1914 amount to over \$25,000,000 more than the rentals received.

In 1910 the non-operating roads reported a credit balance of \$72,567,921. This at the end of four years has been replaced by a debit balance of \$7,736,881. It looks now as if in 1915 the lessor companies will have to rely wholly on current rentals for dividends.

The credit balances of the lessor companies for the past five years were reported as follows:

1910 Credit balance.....	\$72,567,921
1911 Credit balance.....	68,646,496
1912 Credit balance.....	53,390,916
1913 Credit balance.....	31,327,523
1914 Debit balance.....	7,736,881

Thus one surplus upon which the Commission has banked for fictitious yearly dividends has vanished into thin air.

During the same period, 1910-1914, according to official accounts, the operating roads have declared dividends out of surplus to the amount of \$554,557,248, as follows:

1910 Dividends out of surplus.....	\$ 67,790,444
1911 Dividends out of surplus.....	137,598,218
1912 Dividends out of surplus.....	100,701,323
1913 Dividends out of surplus.....	85,706,629
1914 Dividends out of surplus.....	162,760,634

Total five years.....\$554,557,248

Unless like the "widow's cruse" the railway surplus can be replenished from some supernatural source, the net balance must shortly go to join that of the non-operating roads.

IX

TAXES

The 443 companies reporting to the Bureau, owning 203,030 miles of the 245,894 they operated, paid \$139,959,071 taxes in 1914. For the first time this included the tax accounts of their leased roads, except some \$940,055 paid directly by the non-operating roads. The following statement presents a review of taxes paid by the railways of the United States since 1889:

SUMMARY OF TAXES PAID BY THE RAILWAYS OF THE UNITED STATES SINCE 1889, ANNUALLY PER MILE AND RELATIVELY.

Year	Taxes Paid	Per Mile	Percentage of Earnings
1914 Bureau figures	\$139,959,071	\$569	4.60
1913 Official figures* ^o	127,331,960	524	4.08
1912 " " *	120,091,534	487	4.26
1911*	108,309,512	442	3.88
1910°	103,795,701	431	3.77
1909°	90,529,014	384	3.74
1908°	84,555,146	367	3.53
1907	80,312,375	353	3.10
1906	74,785,615	336	3.21
1905	63,474,679	292	3.04
1904	61,696,354	290	3.12
1903	57,849,569	281	3.04
1902	54,465,437	272	3.15
1901	50,944,372	260	3.20
1900	48,332,273	250	3.24
1899	46,337,632	247	3.53
1898	43,828,224	237	3.51
1897	43,137,844	235	3.84
1896	39,970,791	219	3.48
1895	39,632,433	224	3.70
1894	38,125,274	211	3.56
1893	36,514,689	215	2.99
1892	34,053,495	209	2.90
1891	33,230,095	206	3.04
1890	31,207,469	199	2.96
1889	27,580,394	179	2.86
Aggregate Taxes 26 Years	\$1,680,310,952		
Percentage of Increase	407.2%	218%	60.89%

^oClass I and II roads only.

*Does not include switching and terminal companies.

If the value of railway property has increased in the same ratio as the taxes levied upon it since 1889, the above table proves that it has increased five-fold, or from seven to thirty-five billion dollars.

SUMMARY SHOWING RAILWAY TAXES BY STATES AND PER MILE IN 1913—CLASS I AND II ROADS ONLY.

	Amount	Per Mile of Line
New Jersey	\$ 6,823,429	\$3,187
Rhode Island	350,960	1,773
Massachusetts	3,542,864	1,699
District of Columbia	56,742	1,659
New York	10,526,756	1,291
Connecticut	1,115,007	1,114
Ohio	7,800,153	872
Pennsylvania	8,489,875	810
Washington	3,749,488	769
Maryland	951,652	733
New Hampshire	862,257	691
Indiana	4,536,007	624
Oregon	1,479,983	—
Idaho	1,434,985	594
Illinois	6,866,113	575
California	4,230,926	571
Wisconsin	3,855,843	544
Minnesota	4,808,295	543
Virginia	2,244,540	532
Oklahoma	3,117,403	509
Michigan	4,013,839	478
West Virginia	1,482,545	477
Kentucky	1,637,277	469
Utah	933,246	456
Maine	971,889	455
Delaware	148,945	445
Nevada	931,520	444
Montana	1,874,409	428
Arkansas	1,765,688	419
Arizona	884,808	418
Wyoming	655,993	403
Vermont	386,888	395
Kansas	3,401,968	380
Nebraska	2,324,355	378
Tennessee	1,344,055	370
North Dakota	1,802,379	364
Mississippi	1,364,658	354
Colorado	1,847,843	339
New Mexico	970,915	337
Louisiana	1,486,000	330
Alabama	1,559,168	322
North Carolina	1,328,202	313
Iowa	2,830,763	294
Missouri	2,204,835	283
South Carolina	863,742	272
Georgia	1,721,666	262
Florida	1,063,651	257
South Dakota	956,241	255
Texas	3,216,712	225
Total United States	\$122,817,394	225

The total in this statement varies from the figures given in the preceding table because that included nearly \$5,000,000 assessed by the United States government not localized by states, and mileage owned is used as the divisor in this table.

It will be observed that eighteen states and the District of Columbia pay an amount of taxes per mile above the average paid in all the railways in the United States.

X

DAMAGES AND INJURIES TO PERSONS

Under this heading we come to certain items of expenses which no precautions of management, no decline in business, seem able to curb. Fat years and lean years are all the same to claim agents, as the next summary shows:

SUMMARY OF PAYMENTS ON ACCOUNT OF INJURIES TO PERSONS AND
LOSS AND DAMAGE DURING THE YEARS 1914 AND 1913.

Account	Amount 1914	Amount 1913	Per Cent of Earnings	
			1914	1913
Injuries to Persons:				
Maintenance of Way.....	\$ 3,142,382	\$ 3,013,975		
Maintenance of Equipment.....	2,531,181	2,310,053		
Transportation.....	27,031,990	25,570,684		
Total.....	\$32,705,553	\$30,894,712	1.07	.99
Loss and Damage:				
To Freight.....	33,616,693	31,058,271		
To Baggage.....	318,144	413,212		
To Property.....	4,499,757	4,067,221		
To Live Stock, etc.....	4,184,367	4,172,665		
Total, Loss and Damage.....	\$42,618,961	\$39,711,369	1.40	1.37
Grand Total.....	\$75,324,514	\$70,606,081	2.47	2.26

For the first time since the records have been kept, the payments for injuries to persons exceed 1% of the total revenues from transportation. Even at that they have not increased much more rapidly than the payments on account of loss and damage to freight. For both the increase in 1914 was nearly 10%, where there was a decrease of $2\frac{1}{2}\%$ in traffic. It is this feature of the failure of these expenses to follow the recession in traffic that is of most serious concern to railway managers.

The next table shows how persistent has been the trend of these expenditures, both absolutely and relatively, since 1899:

PAYMENTS ON ACCOUNT OF "LOSS AND DAMAGE" AND "INJURIES TO PERSONS" 1899 TO 1914 AND PROPORTION TO GROSS EARNINGS.

Year	Loss and Damage		Injuries to Persons	
	Amount	Per Cent of Earnings	Amount	Per Cent of Earnings
1899.....	\$ 5,976,082	.455	\$ 7,116,212	.641
1900.....	7,055,622	.474	8,405,980	.565
1901.....	8,109,637	.510	9,014,144	.567
1902.....	11,034,686	.639	11,682,756	.676
1903.....	13,726,508	.722	14,052,123	.739
1904.....	17,002,602	.861	15,838,179	.802
1905.....	19,782,692	.946	16,034,727	.770
1906.....	21,086,219	.907	17,466,864	.751
1907.....	25,796,083	.996	21,462,504	.829
1908.....	34,631,243	1.447	20,088,543	.839
1909.....	32,922,986	1.386	23,456,038	.988
1910.....	30,707,675	1.134	23,284,145	.859
1911.....	34,397,279	1.233	26,034,383	.933
1912.....	34,197,285	1.220	27,640,851	.985
1913.....	39,711,369	1.273	30,894,712	.991
1914.....	42,618,961	1.401	32,708,553	1.075
Increase in 15 Years, per cent...	613%	208%	359%	98%

While the increase of 613% and 359½%, respectively, in payment on these two accounts in 15 years is the more sensational, the rise of such payments relatively to revenues is the more serious. It records the growth of a parasitical expenditure beyond the control of the ordinary resources of railway management.

The accounts present what may be regarded as an American railway phenomenon. In Germany the payments on account of indemnities and accident insurance amount to less than \$5,000,000 annually, and employes contribute to the funds out of which they are paid. In England payments on these accounts have increased less than 50% for the same period where ours increased 475%. Only a change in the attitude of courts and public sentiment can bring relief.

XI

LOCOMOTIVE FUEL

According to the returns to this Bureau for 1914 the 443 roads reporting paid \$243,524,752 for locomotive fuel, a decrease of \$5,672,741 from the amount paid in 1913. Almost all of this saving was in fuel of road locomotives, the cost of which for 1914 was \$207,925,123 against \$213,307,494 in 1913. Yard fuel in 1914 cost \$35, 599,629 against \$35,889,999 in 1913.

The following summary gives the expenditure of the railways for fuel since 1899, together with the proportion to operating expenses and gross earnings during the period:

SUMMARY OF COST OF LOCOMOTIVE FUEL AND PROPORTION TO EARNINGS AND EXPENSES OF AMERICAN RAILWAYS, 1914 TO 1899, WITH PRICE OF BITUMINOUS COAL PER TON DURING THE SAME PERIOD.

Year	Miles of Line	Cost of Locomotive Fuel	Proportion to Operating Expenses	Proportion to Gross Earnings	Price of Coal at Mines per Ton*
1914 Bureau Figures	245,894	\$243,524,752	11.087	8.01	.....
1913 " "	242,177	249,197,493	11.516	7.98	1.18
1912 " "	236,444	230,555,544	11.850	8.23	1.13
1911 Official " "	246,238	232,622,502	12.147	8.34	1.11
1910 " "	240,830	217,780,953	11.953	7.92	1.12
1909 " "	235,402	188,735,968	11.804	7.81	1.07
1908 " "	230,494	201,905,054	12.097	8.44	1.12
1907 " "	227,454	200,261,975	11.471	7.74	1.14
1906 " "	222,340	170,499,133	11.119	7.34	1.11
1905 " "	216,973	156,429,245	11.278	7.51	1.06
1904 " "	212,243	158,948,886	11.893	8.05	1.10
1903 " "	205,313	146,509,031	11.675	7.70	1.24
1902 " "	200,154	120,074,192	10.776	6.96	1.12
1901 " "	195,561	104,926,568	10.602	6.61	1.05
1900 " "	192,556	90,593,965	8.899	6.09	1.04
1899 " "	187,534	77,187,344	9.478	5.93	.87

*These figures are from the latest report of the United States Geological Survey.

In quantity and value the production of bituminous coal in the United States in 1913 marked a new high record. The average price per ton at the mines, \$1.18, was the highest for any normal year in the history of the industry. The abnormal points in the above table are 1903 and 1907, one being due to the great coal strike and the other to the demands of a great industrial year. It will be noted that the average price of coal in 1913 was only exceeded by that in 1903.

XII

ACCIDENTS

"Safety First," and not "Accidents First," has been the governing principle in the Bureau's compilation of the casualties that beset the carrying of billions of passengers and tons of freight by the railways of the United States. It is the common practice of the press and railway commissions to make more ado over the comparatively few fatal disasters that attend the handling of an enormous traffic than to dwell upon the millions upon millions of units that pass daily in safety over the rails without a reportable mishap.

By reason of two contributing causes—neither directly traceable to legislative or regulative activity—1914 stands pre-eminently a year of comparative freedom from fatal railway accidents. These causes were the recession in freight traffic, greatly reducing the units of risk, and the "Safety First" movement pushed with great energy and success by the operating officials of the roads. What part restrictive laws and orders played in bringing about the depression in business is beyond the ken of statistics. But the reduction in the volume of traffic and in the number of employes was attended by the usual decrease in railway accidents; while, contrary to the claims of their advocates, Full or "Excess Crew" laws have contributed to accidents rather than safety, and Employers' Liability laws have tended to relax the inter-fellowship responsibility among employes.

THE SAFETY OF AMERICAN RAILWAYS

During the year just passed, 315 of the 443 roads reporting to this Bureau, operating a mileage almost equal to that of the railways of Germany, France, Austria-Hungary and the United Kingdom, had an absolutely clear record in the matter of passengers killed in train accidents. The figures in regard to this remarkable immunity from the class of accidents which it is especially the duty of railways to guard against are set forth in the following statement:

SUMMARY OF MILEAGE AND TRAFFIC OF ROADS ON WHICH NO PASSENGER WAS KILLED IN A TRAIN ACCIDENT DURING THE YEARS 1914, 1913 AND 1912:

	1914	1913	1912
Number of Operating Companies.....	315	299	290
Mileage of These Companies.....	113,333	120,901	101,164
Passengers Carried.....	458,661,601	409,808,488	332,184,818
Passengers Carried 1 Mile.....	15,304,120,000	14,400,992,000	11,218,321,000
Tons of Freight Carried.....	1,002,185,285	968,764,956	867,909,428
Tons of Freight Carried 1 Mile.....	147,009,326,000	141,790,227,000	105,580,384,000
Passengers Killed in Train Accidents.....	None	None	None
Passengers Injured in Train Accidents.....	2,658	3,724	3,525

By reference to the traffic statistics on another page it will be perceived that this record of immunity covers well nigh half of the carrying trade of the railways of the United States. To be exact, these 315 roads account for 43.5% of the total passenger mileage and 50.9% of the freight mileage of the country. Moreover, it includes roads representing every variety of condition of territory and climate under which our railways are operated, from that with a few shaky rails and equipment to the premier road of the continent. In the matter of safety, the block signal system has contributed its share to the desired end, but the majority of this mileage has relied for its efficiency on automatic and unerring observance of rules.

ELEVEN YEAR RECORD OF IMMUNITY

That the above showing is no mere chance flash of safety to be immediately swallowed up in a succession of disastrous years is shown in the following record of safety that has been kept by the Bureau for eleven consecutive years:

STATEMENT SHOWING NUMBER OF RAILWAYS AND MILEAGE ON WHICH NO PASSENGER HAS BEEN KILLED IN A TRAIN ACCIDENT, 1904 TO 1914:

Period	Number of Companies	Miles of Line With NO Fatalities to Passengers in Train Accidents
Eleven years, 1904-1914.....	4	1,643
Ten " 1905-1914.....	27	6,452
Nine " 1906-1914.....	46	8,491
Eight " 1907-1914.....	55	9,159
Seven " 1908-1914.....	71	12,390
Six " 1909-1914.....	90	22,160
Five " 1910-1914.....	104	24,475
Four " 1911-1914.....	128	35,450
Three " 1912-1914.....	168	47,260
Two " 1913-1914.....	224	67,324
One year 1914.....	315	113,333

It will be perceived that 104 roads, having a mileage greater than that of the United Kingdom, have been operated five consecutive years without a single fatality to a passenger in a train accident. Similarly 128 roads, having a mileage almost as great as that of the German Empire, have been operated four years consecutively without such an accident.

It should be remarked that the four roads that have headed this remarkable list of safe operation for two years had an increased mileage in 1914 of 230 miles, for which the Bureau has no record.

26 ROADS WITHIN ONE OF PERFECT IMMUNITY

How mischance forever lurks in the wake of vast units of risk is shown in the record of 26 companies, operating 34,826 miles of line, which came within one life each of having perfect immunity from fatalities in train accidents in 1914, as set forth in the following statement:

SUMMARY OF MILEAGE AND TRAFFIC OF ROADS ON WHICH ONLY
ONE PASSENGER WAS KILLED IN A TRAIN ACCIDENT DURING
THE YEARS 1914, 1913 AND 1912.

	1914	1913	1912
Number of Operating Companies.....	23	15	14
Mileage of These Companies.....	34,826	25,361	23,105
Passengers Carried.....	115,198,252	73,639,499	58,194,180
Passengers Carried 1 Mile.....	4,930,170,000	3,113,427,000	3,150,736,000
Tons of Freight Carried.....	264,749,662	174,339,862	116,881,967
Tons of Freight Carried 1 Mile.....	45,379,835,000	29,003,500,000	22,898,165,000
Passengers Killed in Train Accidents.....	23	15	14
Passengers Injured in Train Accidents.....	1,399	1,157	731

Combining this table with that of complete immunity above, the reader has a record of 338 American railways, operating 148,159 miles of line and carrying considerably more than one-half of the passenger and freight traffic of the Republic, operated twelve months with only 23 fatalities to passengers in train accidents. Moreover, this list includes four large systems with a combined mileage of over 21,500 which only missed the goal of complete immunity by four fatalities.

With these evidences of the continuing safety of American railways fixed in his mind, the reader can approach the figures of miscellaneous railway accidents without undue trepidation. Aside from the sorrow and suffering these accidents cause to individuals and families, they should be studied with a view to prevention. Analysis establishes that less than 6% of all railway accidents can be reached by safety appliances. The remaining 95% being due to individual fault, mischance or recklessness can only be lessened by discipline and education along the lines inculcated by the promoters of the "Safety First" movement.

RAILWAY ACCIDENTS IN 1914

It is not alone in the complete immunity of a large proportion of railway operation from fatalities to passengers in train accidents that 1914 stands out as a white year in the record of American railway operation. Relatively to traffic it shows the smallest number of fatalities of all descriptions to passengers and employes since the information has been officially available.

The following statement gives the number of casualties to persons in railway accidents for the years 1914 and 1913, as reported to the Commission, and the totals of killed and injured since 1899:

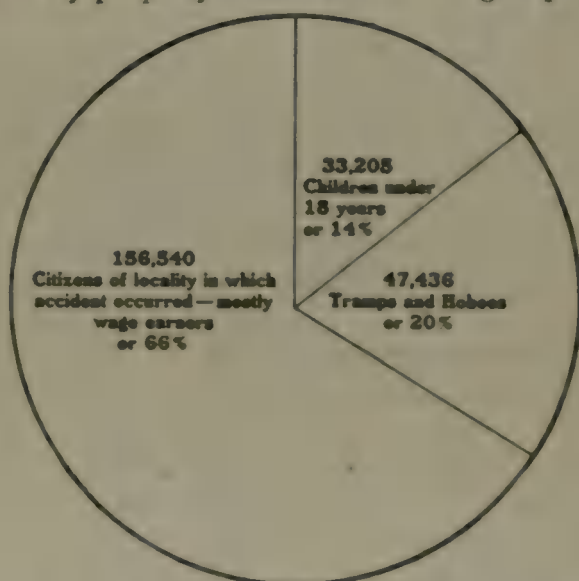
SUMMARY OF CASUALTIES TO PERSONS IN RAILWAY ACCIDENTS FOR THE YEARS 1914 AND 1913, AND ANNUAL FIGURES SINCE 1899.

	1914		1913	
	Killed	Injured	Killed	Injured
PASSENGERS—				
In Collisions.....	31	3,016	119	3,902
Derailments.....	40	2,941	22	3,513
Other Accidents to Trains.....		36		100
Other Causes.....	152	7,047	195	6,892
Total Passengers.....	223	13,040	336	14,407
EMPLOYEES—				
In Collisions.....	231	2,660	302	3,935
In Derailments.....	217	2,391	244	2,806
In Other Accidents to Trains.....	18	780	51	1,311
In Coupling Accidents.....	171	2,692	195	3,360
Overhead Obstructions, etc.....	90	1,498	96	1,844
Falling from Cars, Getting on or off Cars, etc.	513	14,740	575	16,157
Other Causes.....	1,325	28,161	1,543	29,338
Total Employees on Duty.....	2,565	52,922	3,006	58,751
Total Passengers and Employees on Duty..	2,788	65,962	3,342	73,168
EMPLOYEES NOT ON DUTY—				
In Train Accidents.....	5	117	12	146
In Coupling Accidents.....		2		1
Overhead Obstructions, etc.....	3	5	■	■
Falling from Cars, etc.....	54	370	65	408
Other Causes.....	265	603	283	614
Total.....	327	1,097	362	1,178
OTHER PERSONS, Not Trespassing—				
In Train Accidents.....	■	148	■	110
Other Causes.....	1,298	5,827	1,279	5,932
Total.....	1,307	5,975	1,288	6,042
TRESPASSERS—				
In Train Accidents.....	75	178	90	174
Other Causes.....	5,396	6,176	5,468	6,136
Total.....	5,471	6,354	5,558	6,310
Total Accidents Involving Train Operation..	9,893	79,388	10,550	86,688
INDUSTRIAL ACCIDENTS, not Involving Train Operation.....	409	113,274	414	113,620
Grand Total 1914.....	10,302	192,662	10,964	200,308
1912.....	10,585	169,538		
1911.....	10,396	150,159		
1910.....	9,632	119,507		
1909.....	8,722	95,626		
1908.....	10,188	104,230		
1907.....	11,839	111,016		
1906.....	10,618	97,706		
1905.....	9,703	86,008		
1904.....	10,046	84,155		
1903.....	9,840	76,553		
1902.....	8,558	64,663		
1901.....	8,455	53,339		
1900.....	7,865	50,320		
1899.....	7,123	44,620		

The number of passengers (71) here shown to have been killed in train accidents is the smallest since 1896, although in the meantime passenger traffic has increased 170%.

Only once before since 1902 has the number of employes killed in a twelvemonth fallen below 3,000 and that was in 1909, when the number of employed was 170,000 less than in 1914.

Only in the death roll of trespassers does the reviewer find no response to the persistent appeals of the railways to the public, legislatures and courts to assist in reducing this mortality. In every state of the Union the railways are urging the adoption of laws to prevent trespassing on the tracks and rights of way of railroad companies within the respective states, and they have secured the approval of the National Association of Railway Commissioners for statutes to that effect. But legislatures are slow to act, and where they have passed such laws magistrates and inferior courts are slow to enforce them. In connection with this campaign the Central Safety Committee of the Chicago & North Western Railway Company has sent out a striking diagram which classifies the 113,570 persons killed and 123,611 injured in twenty-five years while trespassing on railway property into three distinct groups, as follows:



Classification of Victims in Casualties to Trespassers on Railways:
Total, 237,181 Killed and Injured in United States in 25 Years.

It will be observed that the number of injured in industrial accidents, which have nothing to do with railway operation, shows no diminution in a year when general depression laid off over 22,000 railway shopmen. The number reported injured indicates that only

two out of three railway shopmen escape some sort of a reportable scratch. In Germany, shopmen are properly excluded from statistics of railway accidents.

RAILWAY FATALITIES SINCE 1888

The next statement gives the results of the Commission's compilation of statistics of railway accidents from the time of its organization down to 1914:

SUMMARY OF PASSENGERS, EMPLOYES AND OTHER PERSONS KILLED IN RAILWAY ACCIDENTS FROM 1888 TO 1914.

Year	Passengers	Employees	Other Persons		Total
			Trespassers	Not Trespassing	
1914.....	223	2,892	5,471	1,716	10,302
1913.....	336	3,386	5,558	1,702	10,964
1912.....	270	3,283	5,434	1,198	10,185
1911.....	281	3,238	5,284	1,154	9,957
1910.....	324	3,382	4,864	1,112	9,682
1909.....	335a	2,456	5,124	854	8,769
1908.....	406a	3,358	5,560	940	10,264
1907.....	647a	4,353	5,612	1,044	11,656
1906.....	418a	3,807	5,381	949	10,618
1905.....	537	3,261	4,865	940	9,703
1904.....	441	3,367	5,105	868	10,046
1903.....	355	3,233	5,000	879	9,840
1902.....	345	2,516	4,403	871	8,588
1901.....	282	2,675	4,601	897	8,455
1900.....	249	2,550	4,346	660	7,805
1899.....	239	2,210	4,040	635	7,123
1898.....	221	1,958	4,063	617	8,859
1897.....	222	1,693	3,919	603	6,437
1896.....	181	1,861	3,811	595	6,448
1895.....	170	1,811	3,631	524	6,136
1894.....	324	1,823	3,720	580	6,447
1893.....	299	2,627	3,673	647	7,346
1892.....	376	2,554	3,603	614	7,147
1891.....	293	2,060	3,465	611	7,029
1890.....	286	2,451	3,092	536	6,335
1889.....	310	1,972	Not	13,541	5,823
1888.....	315	2,070	Given	12,897	5,282

aIncludes trespassers.

(a) Passenger totals for these years, and presumably prior thereto since 1901, include fatalities to persons traveling on freight trains and under special agreements, such as postal clerks, express messengers, Pullman employes, newsboys, etc., who do not ordinarily figure in passenger statistics.

This table ought to be in the hands of every person confronted with the general impeachment of American railways on their accident record. The figures for 1914 show an absolute decrease in the number of passengers killed, not only from any year in the last decade, but from every year since 1888, except the four years 1895-8, when passenger traffic averaged only 36% of the traffic of 1914.

Equally encouraging is the showing as to employes. Where there has been an increase of only 40% in fatalities to employes, there was an increase of 140% in the number employed and nearly 390% in freight ton mileage.

It is only when the eye falls upon the heavy totals for trespassers that congratulations on progress toward reasonable immunity from accidents in connection with railway operation cannot be indulged. As said above, responsibility for this annual toll of fatalities to trespassers rests upon legislators, courts, and ultimately upon the recklessness of the American people.

RELATION OF PASSENGER TRAFFIC TO FATALITIES

In order to arrive at a just appreciation of the remarkable safety attending passenger travel in the United States in 1914, it is necessary to compare the number of passengers *killed in train accidents* with the number carried one mile for a period of years, as is done in the following summary:

PASSENGERS CARRIED ONE MILE TO ONE KILLED, 1889 TO 1914

Year	Passengers Killed in Train Accidents	Passengers Carried One Mile	Passengers Carried One Mile to One Killed
1914.....	71	35,129,269,000	494,778,436
1913.....	141	34,447,197,000	244,703,362
1912.....	114	33,510,673,000	293,953,272
1911.....	94	33,201,694,699	353,209,518
1910.....	179	32,338,496,329	180,661,991
1909.....	102	29,452,000,000	288,745,100
1908.....	148	29,082,836,944	196,595,648
1907.....	367	27,718,554,030	72,802,600
1906.....	137	25,167,240,831	183,702,488
1905.....	350 ^a	23,800,149,436	68,000,427
1904.....	270	21,923,213,536	81,197,087
1903.....	164	20,915,763,881	127,535,745
1902.....	170	19,689,937,620	115,423,162
1901.....	110	17,353,588,444	157,759,894
1900.....	93	16,038,076,200	172,463,183
1899.....	83	14,591,327,613	175,799,127
1898.....	74	13,379,930,504	180,809,864
1897.....	96	12,256,939,647	127,676,454
1896.....	41	13,049,007,233	318,248,460
1895.....	30	12,189,646,271	406,281,542
1894.....	162	14,289,445,893	88,206,456
1893.....	100	14,229,101,084	142,291,010
1892.....	195	13,362,898,299	68,521,555
1891.....	110	12,844,243,881	116,765,833
1890.....	113	11,847,785,617	104,847,660
1889.....	161	11,553,820,445	71,762,850

(a) In 1905 and prior thereto, these figures probably include fatalities to many persons not covered by other returns for passengers. See Note to preceding table.

It will be observed that the only year in this table approaching within 100,000,000 passenger-miles-to-one-killed record of 1914 was 1895, when passenger traffic was at its lowest ebb after the panic of 1893.

It is safe to say that no other combination of railways in the world with an aggregation of 35 billion passenger miles and 288 billion freight ton miles ever approached the record of passenger immunity from fatalities in train accidents in a single year presented by the first line in the above table.

In the United Kingdom, which boasts of an occasional year without a single fatality to a passenger in a train accident, the record for the past forty years has averaged 21 a year. Compared on the basis of the units of risk, of mileage and traffic in the countries, this would be equivalent to over 210 a year in the United States. From which the reader can have a fair idea of the meaning of only 71 passengers killed in train accidents in the United States in 1914.

DECREASING HAZARD OF TRAINMEN

Every demand for increased wages by enginemen and other trainmen is attended with harrowing tales of the increasing hazard of the service due to heavier equipment, greater speed, etc. For twenty years the evidence of the returns of trainmen killed in railway accidents has consistently refuted this claim. Allowing for the fluctuations which follow the rise and fall of traffic, the next statement exhibits how the occupation of trainmen has become safer, on the average year by year, 1914 showing a record of immunity unapproached in the 26 years covered by this table:

SUMMARY SHOWING NUMBER OF TRAINMEN KILLED IN RAILWAY ACCIDENTS, 1889 TO 1914, WITH RATIO TO NUMBER EMPLOYED

	Trainmen	Trainmen in Yards	Yard Trainmen Switching Crews	All Trainmen	Number of Trainmen for One Killed
1889.....	1,179			1,179	117
1890.....	1,459			1,459	106
1891.....	1,533			1,533	104
1892.....	1,503			1,503	113
1893.....	1,567			1,567	115
1894.....	1,029			1,029	156
1895.....	1,017			1,017	155
1896.....	1,073			1,073	152
1897.....	976			976	165
1898.....	1,141			1,141	150
1899.....	1,155			1,155	155
1900.....	1,396			1,396	137
1901.....	1,537			1,537	136
1902.....	1,507			1,507	135
1903.....	2,021			2,021	123
1904.....	1,181	487	488	2,156	120
1905.....	1,155	386	493	2,034	133
1906.....	1,360	400	575	2,335	124
1907.....	1,507	459	630	2,596	125
1908.....	1,097	362	496	1,955	150
1909.....	789	270	313	1,372	■
1910.....	1,066	325	474	1,865	■
1911.....	905	313	490	1,703	182
1912.....	917	265	481	1,663	192
1913.....	869	304	527	1,700	197
1914.....	738	260	479	1,477	210

Between 1904 and 1914, covering the years since the trainmen have been classified as above, the number of trainmen increased from 253,834 to 311,131, or 22%. In the meantime the number of fatalities to trainmen fell from 1,181 to 738, a decrease of 37%. Admitting that 1914 was a year of gratifying safety to trainmen, the average figures for the past seven years show an improvement that cannot be gainsaid on the witness stand or in argument before arbitrators. The greater safety of trainmen in yards is equally evident, and there is reason for encouragement that the campaign for "Safety First" will work equally satisfactory results in other branches of the service.

CAUSES OF ACCIDENTS

Investigations of railway accidents by the Commission continue to fix the blame for nearly 94% of them on some failure of the human equation. In his report covering accident investigation during the quarter ending June 30, 1914, the Chief of the Division of Safety reported that "None of the employes involved in any of these accidents was on duty contrary to the provisions of the hours-of-service law." In his summary of the several accidents investigated he found them due to the following causes:

1. "This accident was caused by a broken rail."
2. "This accident was caused by a bridge collapsing under the second train after having been damaged by the derailment of the first train." Does not refer to No. 1.
3. "This accident was caused by the failure of a leverman to set up a proper route for a train."
4. "This accident was caused by one train attempting to couple on to another while both trains were in motion."
5. "This accident was caused by the train crews failing properly to protect their trains."
6. "This accident was caused by the failure of an engineman to observe and obey stop signals."
7. "This accident was caused by a locomotive occupying the main track on the time of a superior train."
8. "This accident was caused by the failure of a flagman properly to protect the rear of his train, and by the failure of an engineman properly to control the speed of his train."
9. "This accident was caused by the fill on which the track was laid sliding out from under the train."
10. "This accident is believed to have been caused by excessive speed."
11. "This accident was caused by a train occupying the main track on the time of a superior train."
12. "This accident was caused by the failure of the freight train crew to close the main track switch."
13. "This accident was caused by failure of operator to display order board in stop position and deliver a train order."

14. "This accident was caused by an arch bar tie strap wedging between the switch point and stock rail, causing the switch point to spread."

15. "This accident was caused by a broken flange on a wheel of a box car."

16. "This accident was probably caused by the irregularities in track and the locomotive running in backward motion at excessive speed."

These sixteen accidents resulted in thirty-two killed and 460 injured, and again demonstrated that the freight traffic is responsible for a great majority of the casualties on American railways.

ACCIDENTS ON BRITISH RAILWAYS

British railways continue to illustrate the high degree of safety secured through the training of employes to automatic obedience to established regulations rather than relying on patent devices. The next summary gives the casualties on British roads for 1913 and 1912, with totals since 1902:

SUMMARY OF CASUALTIES ON BRITISH RAILWAYS FOR 1913 AND 1912, WITH TOTALS FOR ELEVEN YEARS.

Class	1913		1912	
	Killed	Injured	Killed	Injured
A. Passengers:				
From Accidents to Trains, Rolling Stock, Permanent Way, etc.	33	723	20	683
By Accidents from Other Causes.....	117	2,918	100	2,843
Total of Passengers.....	150	3,641	120	3,526
B. Servants of Companies or Contractors:*				
From Accidents to Trains, Rolling Stock, Permanent Way, etc.	8	145	6	154
By Accidents from Other Causes.....	455	20,102	397	28,046
Total of Servants.....	463	20,247	403	28,200
C. Other Persons:				
From Accidents to Trains, etc.....		3		4
Persons Passing over Railways at Level Crossings.....	64	46	69	32
Trespassers (including suicides).....	458	132	458	127
Persons on Business at Stations, etc., and Other Persons not Coming in Above Classifications.....	59	727	68	731
Total of Other Persons.....	581	908	595	894
Total all Classes 1913.....	1,194	33,706	1,118	32,620
" " " 1912.....	1,118	32,620		
" " " 1911.....	1,159	32,258		
" " " 1910.....	1,121	30,110		
" " " 1909.....	1,033	28,383		
" " " 1908.....	1,128	28,485		
" " " 1907.....	1,211	25,975		
" " " 1906.....	1,252	20,444		
" " " 1905.....	1,180	18,236		
" " " 1904.....	1,158	18,802		
" " " 1903.....	1,202	18,557		
" " " 1902.....	1,171	17,814		
Total Twelve Years.....	13,987	305,480		

*Of contractors' servants in 1913, nine were killed and twenty-six injured.

The jump in injuries shown in the above table between 1905 and 1907 and since was due to the same cause that boosted the same class of casualties in the United States from 95,626 in 1909 to 200,308 in 1912. The increase was wholly due to the adoption of a truly latitudinarian standard as to what constitutes a reportable injury. It has no statistical meaning or value whatever.

In comparing railway accidents in the United Kingdom and the United States it is well to remember that the sum of our mileage and traffic is about eleven times that of British roads.

RAILWAY ACCIDENTS IN GERMANY

In Germany, under government ownership, a sharp line is drawn between accidents for which the management is responsible and those due to the victim's own fault or mischance, as is shown in the following summary for the years 1910, 1911 and 1912:

SUMMARY OF RAILWAY ACCIDENTS IN GERMANY FOR THE YEARS 1910, 1911 AND 1912.

	1910		1911		1912	
	Killed	Injured	Killed	Injured	Killed	Injured
Passengers:						
In Accidents to Trains.....	2	422	14	324	6	348
Other Accidents:						
Without Fault of Their Own.....	4	72	3	52	1	57
As Result of Their Own Carelessness.....	91	178	94	207	124	226
Total Passengers.....	97	672	115	583	131	631
Employees on Duty:						
In Train Accidents.....	14	202	36	179	24	181
In Other Accidents:						
Through Their Own Carelessness:						
In Trains or Cars in Motion.....	62	297	64	280	82	277
In Making up Trains.....	60	239	55	23	75	272
In Coupling Cars.....	92	175	95	173	120	217
While on Tracks in Way of Moving Cars or Trains.....	240	218	243	235	295	280
Through Other Forms of Carelessness.....	75	219	67	213	86	200
Total Employees on Duty.....	543	1,350	533	1,343	682	1,457
Post Telegraph, Police, and Customs Staff....	6	68	13	70	15	60
Trespassers, Including Employees Not on Duty	280	248	324	271	326	311
Suicides.....	338	27	349	26	457	31
Total Trespassers, Etc.....	624	343	706	307	708	411
Total all Classes.....	1,264	2,365	1,384	2,293	1,611	2,499

The official German reports very properly exclude accidents in the shops from those chargeable to railway operation.

Attention need scarcely be called to the comparatively small number of injuries reported. The contrast between these and the staggering number of injuries reported against British and American railways is suggestive of the difference in standards of state and privately owned roads. Where the German standard may be harsh, the British and American standards are ridiculously lax.

RAILWAY ACCIDENTS IN EUROPE

One of the railway myths that disappears before the clear logic of comparative statistics is that railway operation is attended with greater risk in America than in Europe. With 50,000 more operated mileage and 46% as much passenger traffic there were only 30% as many passengers killed on American railways in 1914 as on those of Europe during the last year for which returns are available. And with more than double the freight ton mileage the number of fatalities to employes was actually less, although in proportion to the number employed it was greater.

The next summary gives the number of passengers, employes and other persons killed in railway accidents in the European countries named, according to the latest reports:

KILLED IN EUROPEAN RAILWAY ACCIDENTS.

(MILES OF LINE REPRESENTED, 197,740)

Country	Year	Pas- sengers	Em- ployes	Other Persons	Total	Preced- ing Year
United Kingdom	1913	150	463	581	1,194	1,118
Germany	1912	131	682	798	1,611	1,384
Russia (a)	1910	225	600	1,798	2,623	2,686
France	1910	(b)71	320	c 302	753	692
Austria	1912	22	144	142	308	281
Hungary	1912	20	155	228	403	394
Italy	1912	32	101	269	402	347
Spain	1909	11	65	242	318	303
Portugal	1904				55	37
Sweden	1910	8	25	53	86	
Norway	1913	2	2	16	20	14
Denmark (d)	1913-14	16	6	9	31	23
Belgium	1912	11	75	80	166	164
Holland	1911	3	11	23	37	61
Switzerland	1912	15	41	41	97	
Roumania	1913	12	51	63	126	151
Total Europe		729	3,741	4,705	8,230	7,850
Europe (e)	1912		2,568	4,618	7,023	
"	1911	554	2,607	4,465	7,681	
"	1910		2,659	4,461	7,897	
"	1909	671	2,641	4,322	7,680	
"	1908	630	2,536	3,580	6,803	
"	1907	586	2,575	3,400	6,606	
"	1906	560	2,319	3,553	6,432	
"	1905	503	2,104	3,414	6,021	
"	1904	412	1,920	2,665	4,995	

a Exclusive of local lines and railways of Finland.

b In train accidents only.

c Excluding suicides, but including passengers killed otherwise than in train accidents.

d State railways only.

e These figures are those compiled for this Bureau each year since its organization, the details for each country appearing in the report of the report for the following year.

One unexpected fact is revealed by the above table. There is no great disparity between the proportion of other persons, including trespassers, non-trespassers and suicides killed in Europe and America. Even the strict regulations in Germany are not wholly effective to keep trespassers and suicides off the forbidden tracks.

OVERWORK AND RAILWAY ACCIDENTS

For the second consecutive year the Chief of the Commission's Division of Safety has accompanied the annual report of his investigation of principal railway accidents with the laconic but significant sentence:

"None of the employes involved in any of these accidents was on duty contrary to the provisions of the hours-of-service law."

Disappointing as it must be to the promoters of the hours-of-service law, this sentence might as well be stereotyped. The experience of our Chief Inspector merely confirms the investigations of 8,118 British railway accidents by the inspectors of the Board of Trade, set forth in the following summary of the number of hours on duty of British employes when the accidents occurred:

HOURS WHEN BRITISH ACCIDENTS OCCUR

Three Months to	Off duty	Hours on Duty when Accidents Occurred																
		1st	2d	3d	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th	16th	17th
Sept. 30, 1913...	1	11	13	23	25	20	18	23	18	11	10	16	3	0	1	1	0	0
Dec. 31, 1913 ..	2	24	24	22	24	19	22	21	22	16	14	12	4	3	3	0	0	0
Mar. 31, 1914...	3	10	24	27	24	17	22	20	12	19	14	9	9	1	1	1	0	0
June 30, 1914...	1	10	23	12	15	15	14	13	10	10	15	7	4	1	0	1	0	0
Year 1914.....	7	55	84	84	88	71	76	77	62	56	53	44	20	5	5	3	0	0
" 1913.....	1	77	78	92	58	72	68	72	74	77	62	43	21	3	5	1	1	0
" 1912.....	12	83	66	87	89	80	74	65	53	61	65	42	33	12	5	1	0	2
" 1911.....	10	95	88	75	90	85	88	74	74	66	73	57	35	13	5	2	1	1
" 1910.....	13	57	103	83	68	88	72	72	62	64	63	51	32	7	6	1	2	3
" 1909.....	11	61	72	92	78	69	77	68	60	65	54	51	37	8	0	0	1	0
" 1908.....	11	60	103	83	85	77	81	72	70	63	57	53	35	8	8	0	0	0
" 1907.....	1	70	86	78	78	71	64	59	48	68	62	43	35	14	12	5	3	1
" 1906.....	6	52	64	70	66	63	81	68	70	71	61	42	39	7	4	3	0	2
" 1905.....	3	52	74	65	54	71	66	59	48	53	56	41	37	7	3	3	0	1
Ten Years.....	70	662	818	809	774	747	717	686	621	643	606	467	324	84	53	19	8	10

Contrary to all the theories behind the hours-of-service law the greatest number of accidents for a particular hour happened during the second. From the front they decline consecutively until the ninth hour, when they took a spurt, only to fall away to none in the 16th and 17th hour in 1923.

In the United States in 1913 when the Chief Inspector reported 301,743 cases of employes on duty contrary to the provisions of the hours-of-service statute *not a single accident was traced to these 301,743 instances of overtime.*

XIII

RAILWAY RECEIVERSHIPS

Exclusive of nearly two-score minor roads, there were 28 railway companies of more or less importance in the hands of receivers at the close of the calendar year 1914. Their mileage, capital stock and funded debt are given in the following statement:

RAILWAYS IN RECEIVERS' HANDS IN 1914.

	Mileage	Capital Stock	Funded Debt
Atlanta, Birmingham & Atlantic R. R.....	646	\$35,000,000	\$24,560,500
Cape Girardeau Northern Ry.....	104	2,500,000	1,500,000
Chicago & Eastern Illinois R. R.....	1,283	25,817,800	74,507,000
Cincinnati, Hamilton & Dayton Ry.....	1,014	8,248,515	62,135,640
Colorado Midland Ry.....	338	10,000,000	9,532,000
International & Great Northern Ry.....	1,160	4,822,000	24,594,500
Kansas City, Mexico & Orient Ry.....	260		
Kansas City, Mexico & Orient Ry. of Texas.....	478	25,000,000	29,769,223
Louisiana & North West R. R.....	121	2,180,000	2,300,000
Macon & Birmingham Ry.....	105	500,000	500,000
Missouri & North Arkansas R. R.....	365	8,340,000	9,936,969
Missouri, Oklahoma & Gulf Ry.....	333	8,474,000	9,266,190
New Orleans, Mobile & Chicago R. R.....	403	10,075,300	14,152,602
Oklahoma Central Ry.....	136	3,193,500	3,180,000
Pere Marquette R. R.....	2,323	28,441,200	79,959,165
Pittsburg, Shawmut & Northern R. R.....	291	11,700,000	7,173,358
St. Louis & San Francisco R. R.....	4,746	92,050,100	296,500,242
St. Louis, Brownsville & Mexico Ry.....	518	500,000	12,163,105
St. Louis, San Francisco & Texas Ry.....	243	804,000	7,188,000
San Antonio, Uvalde & Gulf R. R.....	261	230,000	3,663,000
Tennessee Central R. R.....	294	7,941,450	12,709,900
Toledo, St. Louis & Western R. R.....	451	19,947,600	28,027,000
Trinity & Brazos Valley Ry.....	315	500,000	8,760,000
Wabash R. R.....	2,514	92,400,428	124,194,149
Wabash-Pittsburg Terminal Ry.....	89	10,000,000	50,451,834
Wabash, Chester & Western R. R.....	65	1,250,000	690,000
Wisconsin & Michigan Ry.....	124	1,500,000	3,868,245
Wheeling & Lake Erie R. R.....	469	36,980,400	27,000,000
	19,449	\$448,396,291	\$928,282,622
Total capitalization.....			\$1,376,678,913

Eliminating duplications, the net capitalization of these roads is less than \$60,000 per mile.

In the 37 years from 1876 to 1913, the record shows that no less than 754 American roads, with an operated mileage of 145,176 and \$8,262,453,000 capital stock and funded debt, passed into receivers' hands. There is no record of the amount of old capital extinguished and new capital invested before much of this very valuable mileage was restored to the management of its owners. It should be borne in mind that several roads are counted several times in the above figures.

XVI**STATISTICS OF FOREIGN RAILWAYS**

In the following pages the Bureau presents the statistics of the principal countries of the world in the most succinct form compatible with including the essentials. The information in these tables is derived from the official statistics of the country to which they relate, and has been translated into American units by the use of the recognized and current equivalents of value and distance.

RAILWAYS OF CANADA.

STATISTICS OF ALL RAILWAYS FOR YEARS ENDING JUNE 30, 1913, AND 1914, COMPARED WITH GOVERNMENT INTERCOLONIAL.

	Intercolonial	All Canadian Roads	
	1913	1913	1914
Miles of Line Operated.....	1,503	29,304	30,795
Second Track.....	64	1,984	2,293
Yard Track and Sidings.....	401	6,935	7,518
All Tracks.....	1,968	38,223	40,606
Capital Cost*			
Stock.....		\$755,316,516	\$853,110,653
Debenture Stock.....		163,257,224	173,307,470
Funded Debt.....		613,256,952	782,402,638
Government Railways.....	\$97,138,379	126,930,887	133,206,048
Subsidies.....	374,839	214,690,658	233,772,630
Total Capital Cost.....	\$97,513,218	\$1,873,452,237	\$1,942,526,809
Per Mile of Line.....	66,653	*63,932	63,079
Passenger Traffic			
Passengers Carried.....	3,867,735	46,230,795	46,702,280
Passengers Carried 1 Mile.....	207,505,697	3,265,656,080	3,089,031,104
Average Journey (miles).....	54	71	66
Average Passengers per Train.....	60	62	59
Mileage of Passenger Trains.....	3,092,590	45,652,365	45,219,048
Mileage of Mixed Trains.....	358,416	7,044,194	7,126,841
Receipts from Passengers.....	\$3,355,293	\$64,441,430	\$62,012,296
Receipts per Passenger Mile (cents).....	1.617	1.973	2.007
Freight Traffic			
Tons Carried.....	5,316,461	106,992,710	101,393,989
Tons Carried 1 Mile.....	1,424,519,501	23,032,951,696	22,063,294,685
Average Haul (miles).....	268	216	217
Freight Train Mileage.....	4,895,957	67,320,090	62,470,034
Average Tons per Train.....	342	342	353
Receipts from Freight.....	\$8,128,167	\$174,684,640	\$163,663,744
Receipts per Ton Mile (mills).....	5.70	7.58	7.42
Miscellaneous Receipts.....	\$865,846	\$17,576,633	\$17,406,899
Total Receipts.....	\$12,349,296	\$256,702,703	\$243,083,539
Expenses of Operation			
Way and Structures.....	\$2,150,119	\$35,933,323	\$35,292,226
Maintenance of Equipment.....	3,141,981	37,289,718	36,375,331
Traffic Expenses.....	246,402	6,143,201	6,546,102
Conducting Transportation.....	6,688,412	96,688,264	94,119,067
General Expenses.....	283,398	5,957,184	6,642,032
Total Expenses.....	\$12,510,312	\$182,011,690	\$178,975,258
Ratio to Earnings.....	101.3%	70.9%	73.63%
Net Receipts.....	\$161,016	\$74,691,013	\$64,108,280
Per Cent on Capital Cost.....		3.99	3.30
Gross Receipts per Mile.....	\$3,261	\$8,750	\$7,894
Gross Expense per Mile.....	8,323	6,204	5,812
Net Per Mile.....	\$107	2,546	2,082
Taxes†.....		\$2,444,961	\$2,822,774
Number of Employees.....		178,652	159,142
Compensation.....		\$115,749,825	\$111,762,972
Proportion of Gross Earnings.....		45.09	45.97%
Proportion of Operating Expenses.....		63.59	62.43%
Average per Employee per Year.....		\$648	\$700

*From this all duplications have been eliminated. The capital cost of the Government roads included although not represented by the issue of securities.

†Including \$2.00 17. for mail and \$6,444,214 from exp

†Railways exempt from taxes in Nova Scotia and New Brunswick

‡Deficit.

RAILWAYS OF THE UNITED KINGDOM.

STATISTICS OF MILEAGE, CAPITALIZATION, TRAFFIC AND EMPLOYES
FOR THE YEARS 1910, 1911 AND 1912.

	1910	1911	1912
Length of Railways			
Double Track or More (miles).....	13,072	13,106	13,139
Single Track.....	10,315	10,311	10,302
Total Length of Line.....	23,387	23,417	23,441
All Tracks, Sidings, Etc.....	54,311	54,576	54,909
Total Capitalization (paid up).....			
Capitalization per Mile of Line...	\$6,421,170,080	\$6,447,969,398	\$6,501,272,332
	274,562	275,354	277,346
Passenger Traffic			
Passengers Carried.....	1,306,728,583	1,326,316,990	1,294,337,046
Season Ticket Journeys.....	451,597,800	467,503,800	471,061,000
Passengers Carried 1 Mile.....	13,731,760,800	13,991,802,162	14,123,344,328
Average Journey (miles).....	7.8	7.8	8.0
Receipts from Passengers.....	\$210,612,890	\$215,168,940	\$215,407,648
Receipts per Passenger Mile (cents)...	1.534	1.538	1.525
Mail, Parcels, Luggage, Etc.....	\$46,318,570	\$48,612,704	\$48,880,769
Freight Traffic			
Minerals, Tons Carried.....	405,087,175	409,812,101	401,563,938
General Merchandise.....	109,341,631	113,765,077	118,715,190
Total Freight, Tons.....	514,428,806	523,577,178	520,279,128
Tons Carried 1 Mile.....	12,860,721,150	13,089,429,450	13,006,978,200
Average Haul (miles).....	25	25	25
Receipts from Freight.....	\$299,397,860	\$308,198,217	\$311,917,724
Receipts per Ton Mile (cents).....	2.328	2.354	2.398
Miscellaneous Receipts.....	\$47,180,560	\$47,582,044	\$49,898,999
Total Receipts*.....	\$603,509,880	\$619,561,905	\$626,055,140
Expenses of Operation.....	372,891,030	382,868,802	395,562,550
Ratio of Expenses to Earnings.....	61.8%	61.8%	63.2%
Net Receipts.....	\$230,618,850	\$236,693,103	\$230,492,590
Percentage to Paid-Up Capital...	3.59	3.67	3.55
Gross Receipts per Mile.....	\$25,805	\$26,457	\$26,708
Gross Expenses per Mile.....	15,945	15,900	16,875
Net Receipts per Mile.....	9.860	10,557	9,833
Number of Employees†.....			
Total Compensation.....	\$158,932,400	\$164,781,320	\$170,028,613
Proportion of Gross Earnings.....	26.3	26.6	27.2
Proportion of Operating Expenses.....	42.6	43.1	42.9
Average per Employee per Year.....	\$261.10	\$270.70	\$279.31
Taxes included in Expenses.....	\$24,846,740	\$24,733,914	\$25,013,309

*Includes Rents, Tolls, Steamboats, etc.

†An enumeration of employees made in December, 1913, placed the total at 643,135.

RAILWAYS OF GERMANY.

STATISTICS OF MILEAGE, COST OF CONSTRUCTION, TRAFFIC AND
EMPLOYES FOR THE YEARS 1910, 1911 AND 1912.

	1910	1911	1912
Length of State Railways (miles).....	34,547	34,987	35,481
Length of Private Railways.....	2,193	2,208	2,184
Total.....	36,740	37,195	37,665
Cost of Construction.....	\$4,128,918,723	\$4,244,187,169	\$4,392,651,229
Cost per Mile.....	112,417	114,145	116,662
PASSENGER TRAFFIC			
Passengers Carried.....	1,540,872,110	1,642,903,860	1,743,111,677
Passengers Carried (one mile).....	21,948,393,727	23,460,306,440	24,746,513,960
Average Journey (miles).....	14.24	14.28	14.20
Receipts from Passengers.....	\$198,737,525	\$211,509,644	\$224,719,558
Receipts per Passenger Mile (cents)....	0.913	0.902	0.910
FREIGHT TRAFFIC			
<i>Fast Freight and Express</i>			
Tons Carried.....	4,708,317	5,166,498	5,547,977
Tons Carried One Mile.....	295,296,195	323,961,907	330,336,173
Average Haul (miles).....	62.71	62.70	59.54
Receipts from Same.....	\$18,959,379	\$20,636,771	\$21,741,790
Receipts per Ton Mile (cents).....	6.42	6.37	6.59
<i>All Freight</i>			
Tons Carried.....	531,527,817	570,740,986	612,385,727
Tons Carried One Mile.....	32,124,223,390	35,397,403,111	37,787,266,225
Average Haul (miles).....	60.43	62.01	61.70
Receipts from Freight.....	\$452,960,105	\$491,520,832	\$519,227,398
Receipts per Ton Mile (cents).....	1.41	1.39	1.37
Miscellaneous Receipts.....	\$70,773,575	\$75,403,985	\$83,473,000
Total Receipts.....	\$772,471,205	\$778,434,461	\$827,419,956
Expenses of Operation.....	490,999,294	512,266,834	558,230,395
Ratio Expenses to Earnings.....	67.96%	65.81%	67.47%
Net Receipts.....	\$231,471,911	\$266,167,627	\$269,189,561
Percentage on Cost of Construction...	5.74	6.41	6.29
Gross Receipts per Mile.....	\$19,783	\$21,031	\$22,082
Gross Expenses per Mile.....	13,445	13,840	14,898
Net Receipts per Mile.....	6,338	7,191	7,184
Number of Employees.....	700,370	716,678	743,944
Total Compensation.....	\$269,571,466	\$281,176,191	\$300,723,513
Proportion of Gross Earnings.....	37.3	36.1	36.3
Proportion of Operating Expenses....	54.8	54.9	53.9
Average per Employee per Year.....	\$384.89	\$392.33	\$404.23

RAILWAYS OF FRANCE.

STATISTICS OF MILEAGE, COST OF CONSTRUCTION, TRAFFIC AND
EMPLOYEES FOR THE YEARS 1909, 1910 AND 1911.

	1909	1910	1911
Length of State Railways (miles).....	5,502	5,533	5,559
Length of Private Railways (miles)...	19,474	19,567	19,635
Total	24,976	25,100	25,194
Cost of Construction	\$3,593,565,914	\$3,642,672,038	\$3,720,480,021
Cost per Mile	144,800	146,000	148,625
PASSENGER TRAFFIC			
Passengers Carried	491,936,930	508,558,187	511,096,490
Passengers Carried One Mile	10,132,466,165	10,482,294,329	10,809,560,427
Average Journey (miles).....	20.58	20.58	21.33
Receipts from Passengers (excludes taxes)	\$152,566,798	\$156,106,670	\$162,383,599
Receipts per Passenger Mile (cents)...	1.09	1.08	1.08
FREIGHT TRAFFIC			
Tons Carried	165,027,920	173,241,483	184,635,276
Tons Carried One Mile	13,225,376,441	13,690,172,993	14,438,559,741
Average Haul (miles).....	80.17	78.68	78.18
Receipts from Same	\$184,394,566	\$191,066,642	\$198,292,706
Receipts per Ton Mile (cents).....	1.32	1.33	1.30
Other Receipts	\$5,284,216	\$5,470,200	\$5,980,128
Total Receipts	\$342,245,580	\$352,643,512	\$366,656,433
Expenses of Operation	200,834,711	212,068,769	229,361,949
Ratio Expenses to Earnings	58.7%	60.1%	62.6%
Net Receipts	\$141,410,869	\$140,574,743	\$137,294,484
Total Net Receipts	141,915,519	141,110,012	137,548,035
Per Cent on Cost of Construction ..	3.95	3.87	3.69
Gross Receipts per Mile	\$13,689	\$14,036	\$14,540
Gross Expenses per Mile	8,033	8,441	9,096
Net per Mile	5,656	5,595	5,444
Number of Employees*	453,099	456,657	462,500

*No data as to compensation excepting in "Traction et matériel" where average per employee in 1911 was \$208.63 per year.

BELGIUM AND HOLLAND.

STATISTICS OF MILEAGE, CAPITALIZATION, TRAFFIC AND EMPLOYEES FOR YEARS SPECIFIED.

	Belgium (State Rys.)		Holland (all Rys.)	
	1911	1912	1910	1911
Length of State Rys. (miles)....	2,684	2,696	1,061	1,114
Length of Private Railways....	242	217	917	866
Total.....	2,926	2,913	1,978	1,980
Cost of Construction.....	*\$512,414,202	*\$520,777,053	.....	\$\$\$136,612,000
Cost per Mile.....	190,914	192,770	.....	82,795
PASSENGER TRAFFIC				
Passengers Carried.....	180,840,189	191,814,188	†47,711,000	†46,426,000
Passengers Carried One Mile...	2,685,476,807	2,850,358,834	835,408,420	736,625,720
Average Journey (miles).....	14.85	14.86	17.92	15.87
Receipts from Passengers.....	\$18,956,440	\$19,856,622	\$12,436,674	\$12,998,268
Receipts per Passenger Mile (cents).....	0.71	0.70	1.49	1.76
FREIGHT TRAFFIC				
Tons Carried.....	61,408,969	66,011,442	†16,702,400	†18,579,800
Tons Carried One Mile.....	3,167,474,621	3,441,836,586	†862,785,180	†963,414,900
Average Haul (miles).....	51.58	52.14	†55.19	†55.30
Receipts for Same.....	\$36,288,811	\$39,016,968	\$12,155,274	\$13,404,288
Receipts per Ton Mile (cents) ..	1.14	1.13	†1.38	†1.36
Miscellaneous Receipts.....	\$5,332,189	\$5,065,417	.....	.....
Total Receipts.....	\$60,577,440	\$63,939,007	\$24,591,948	\$26,402,556
Expenses of Operation.....	40,654,493	44,326,853	20,984,830	.....
Ratio Expenses to Earnings....	67.11%	69.63%	85.33%	.....
Net Receipts.....	\$19,922,947	\$19,612,154	\$3,607,118	.....
Per Cent on Cost of Construction.....	3.66	3.80	2.64	.....
Gross Receipts per Mile.....	\$22,546	\$23,695	\$12,433	.....
Gross Expenses per Mile.....	15,131	16,427	10,609	.....
Net Receipts per Mile.....	7,415	7,268	1,824	.....
Number of Employees.....	*70,364	*71,907	.....	.....
Total Compensation.....	\$17,991,907	.....	.....	.....
Proportion of Gross Earnings...	29.69	.....	.....	.....
Proportion of Operating Expenses	44.26	.....	.....	.....
Average for Employee per Year	\$255.69	.....	.....	.....

*Following figures apply to state mileage only.

†Figure for 1897, last published, based on 1,650 miles.

‡Traffic figures include short mileages in Germany, Belgium, etc., bringing total miles 1910 up to 2,288; 1911, 2,322. Vehicles, baggage and live stock not included.

§Omitting one company, 42 miles, not reporting.

¶Includes laborers. Complete returns for 1912, giving compensation, have not been received, owing apparently to the war.

SWITZERLAND AND ITALY.

STATISTICS OF MILEAGE, CAPITALIZATION, TRAFFIC AND EMPLOYEES
FOR THE YEARS 1911 AND 1912.

	Switzerland (all Rys.)		Italy (State Roads only)	
	1911	1912	1911	1912
Length of State Railways (miles).....	1,665	1,661	8,270	8,387
Length of Private Railways.....	1,279	1,353		
Total Length.....	*2,944	*3,014	†8,270	†8,387
Cost of Construction.....	\$351,628,701	\$362,718,808		‡\$1,334,928,118
Cost per Mile.....	120,950	122,165		158,185
PASSENGER TRAFFIC				
Passengers Carried.....	117,325,594	123,523,422	**56,454,345	**89,690,138
Passengers Carried One Mile....	1,511,424,050	1,564,801,998		
Average Journey (miles).....	12.88	12.07		
Receipts from Passengers.....	\$19,647,037	\$20,077,596	\$37,444,981	\$40,796,637
Receipts per Passenger Mile (cents).....	1.30	1.28		
FREIGHT TRAFFIC				
Tons Carried.....	18,202,896	19,613,953	35,548,954	37,145,897
Tons Carried One Mile.....	828,662,905	891,238,570		
Average Haul.....	45.53	45.44		
Receipts from Freight.....	\$24,216,854	\$25,991,431	\$60,539,138	\$63,721,393
Receipts per Ton Mile (cents)....	2.92	2.91		
Other Receipts.....	\$1,897,393	\$1,958,053	\$11,391,535	\$12,050,318
Total Receipts.....	\$45,761,284	\$48,027,080	\$109,375,654	\$116,568,348
Expense of Operation.....	29,120,897	31,852,495	92,296,415	97,871,890
Ratio Expense to Earnings.....	63.64%	66.32%	84.39%	83.96%
Net Receipts.....	\$16,640,387	\$16,174,585	\$17,079,239	\$18,696,458
Percentage on Cost of Construction.....	4.73	4.46		1.40
Gross Receipts per Mile.....	\$15,568	\$15,065	\$13,212	\$13,896
Gross Expenses per Mile.....	9,907	10,588	11,149	11,659
Net Receipts per Mile.....	5,661	5,377	2,063	2,227
Number of Employees.....	41,730	42,607	149,040	148,599
Total Compensation.....			\$51,479,782	\$52,667,655
Proportion of Gross Earnings.....			47.07	45.17
Proportion of Operating Expenses.....			55.78	53.80
Average per Employee per Year.....			\$345.47	\$354.43

*Includes 746 miles narrow gauge and 248 miles cog railways, 1912.

†In addition there were in 1911, 1,772 miles of private lines; in 1912, 1,992 miles.

‡Capital given for 1913, on basis 8,439 miles.

**Italian railways compile no passenger-mile or ton-mile statistics.

AUSTRIA AND HUNGARY.

STATISTICS OF MILEAGE, CAPITALIZATION, TRAFFIC AND EMPLOYES
FOR THE YEARS 1911 AND 1912.

	Austria (all Rys.)		Hungary (all Rys.)	
	1911	1912	1911	1912
Length of State Railways (miles).....	11,634	11,684	10,925	11,205
Length of Private Railways....	2,470	2,501	2,087	2,098
Total.....	14,104	14,185	13,012	13,303
Cost of Construction.....	\$1,702,243,423	\$1,724,079,152	\$901,789,366	\$949,581,820
Cost per Mile.....	120,692	121,542	69,211	71,292
PASSENGER TRAFFIC				
Passengers Carried.....	276,642,501	290,850,985	153,800,002	164,008,000
Passengers Carried One Mile....	4,932,038,000	5,159,144,000	2,958,832,200	3,134,400,080
Average Journey (miles).....	17.83	17.74	19.24	19.11
Receipts from Passengers.....	\$51,724,400	\$54,891,200	\$27,522,943	\$30,399,250
Receipts per Passenger Mile (cents).....	1.05	1.06	0.93	0.97
FREIGHT TRAFFIC				
Tons Carried.....	164,127,228	159,209,564	78,760,000	83,629,000
Tons Carried One Mile.....	10,127,018,000	10,696,550,000	5,579,502,140	5,992,787,940
Average Haul (miles).....	69.30	67.19	70.87	71.67
Receipts from Freight.....	\$147,499,800	\$160,999,300	\$74,588,087	\$80,337,656
Receipts per Ton Mile (cents)...	1.45	1.50	**1.33	**1.34
Miscellaneous Receipts.....	\$13,215,300	\$14,473,900	\$4,787,958	\$4,943,862
Total Receipts.....	\$212,439,500	\$230,364,400	\$106,898,988	\$115,680,768
Expenses of Operation.....	158,552,700	171,900,400	67,321,702	73,912,097
Ratio Expenses to Earnings....	74.62%	74.62%	62.98%	63.89%
Net Receipts.....	\$53,916,800	\$58,464,000	\$39,577,286	\$41,768,671
Per Cent on Cost of Construc- tion.....	3.17	3.28	4.39	4.39
Gross Receipts per Mile.....	\$15,062	\$16,064	\$8,091	\$8,607
Gross Expenses per Mile.....	11,239	11,987	5,095	5,456
Net Receipts per Mile.....	3,823	4,077	2,996	3,151
Number of Employees.....	†276,943	†280,220	†136,334	†147,104
Total Compensation.....	\$89,051,382	\$92,439,338	\$39,505,486	\$44,218,935
Proportion of Gross Earnings ..	41.92%	40.13%	36.96%	38.29%
Proportion of Operating Ex- penses.....	56.18%	53.77%	58.68%	59.83%
Average per Employee per Year.	\$321.55	\$329.88	\$289.77	\$300.41

*863 miles were narrow gauge, 1912.

†includes laborers.

**Fast freight paid 6.43 cents per ton mile in 1911 and 6.56 cents in 1912.

DENMARK, NORWAY AND SWEDEN.

STATISTICS OF MILEAGE, CAPITALIZATION, TRAFFIC AND EMPLOYEES
IN YEARS SPECIFIED.

	Denmark, State Railways		Norway all Railways	Sweden all Railways
	1913	1914	1912-13	1910
Length of State Railways (miles).....	1,210	1,216	1,631	2,739
Length of Private Railways....	1,105	1,117	282	5,935
Total.....	2,315	2,333	\$1,913	8,574
†Cost of Construction.....	*\$75,258,132	*\$76,319,972	\$84,130,007	\$286,183,902
Cost per Mile.....	62,114	62,763	43,788	\$ 33,359
PASSENGER TRAFFIC				
Passengers Carried.....	22,803,161	23,690,045	17,834,565	58,276,650
Passengers Carried One Mile....	490,531,664	496,008,140	286,426,279	976,198,122
Average Journey (miles).....	21.51	20.96	16.06	16.64
Receipts from Passenger Traffic.....	\$6,444,773	\$6,523,592	\$3,351,157	\$12,426,400
Receipts per Passenger Mile (cents).....	1.30	1.30	1.17	1.24
FREIGHT TRAFFIC				
Tons Carried.....	6,039,489	6,289,750	7,217,873	36,932,910
Tons Carried One Mile.....	322,661,173	334,034,863	248,868,372	1,650,359,834
Average Haul (miles).....	53.43	53.11	34.47	44.64
Receipts from Freight.....	\$7,597,064	\$7,855,222	\$4,081,441	\$23,674,356
Receipts per Ton Mile (cents)...	2.33	2.33	1.64	1.53
Other Receipts.....	\$683,584	\$741,739	\$926,090	\$1,399,546
Total.....	\$14,725,421	\$15,120,553	\$8,358,718	\$37,500,302
Expense of Operation.....	12,360,788	12,790,269	6,428,141	27,198,990
Ratio Expenses to Earnings....	83.94%	84.59%	76.90%	72.53%
Net Receipts.....	\$2,364,633	\$2,330,284	\$1,930,577	\$10,301,312
Per Cent on Cost of Construc- tion.....	3.10	3.20	2.29	3.46
Gross Revenue per Mile.....	\$12,161	\$12,421	\$4,351	\$4,416
Gross Expense per Mile.....	10,208	10,507	3,446	3,203
Net Revenue per Mile.....	1,953	1,914	1,005	1,213
Number of Employees.....	13,209	13,198	6,982	.....
Total Compensation.....	\$4,518,275	\$4,644,727	.....	.....
Proportion of Gross Earnings...	30.7	30.7	.....	.....
proportion of Gross Expenses...	36.6	36.3	.....	.....
Average per Employee per Year.	\$342.06	\$351.92	.....	.....

* Figures hereafter apply to state railways only.

† Proportion is smaller than it should be because large items of temporary labor are not segregated in annual report. For the same reason average pay is too high, applying only to permanent employees.

‡ Computed. Complete figures not yet received.

§ Only 1,175 miles standard gauge.

§ State railways alone were capitalized at \$51,590 per mile in 1912.

RUSSIA AND BULGARIA.

STATISTICS OF MILEAGE, CAPITALIZATION, TRAFFIC AND EMPLOYES
FOR SPECIFIED YEARS.

	Russia, all Rys.*		Bulgaria, State Rys.	
	1909	1910	1911	1912
Length of State Railways (miles).....	28,326	28,366	1,197	1,207
Length of Private Railways (miles).....	13,256	13,256	.....	.....
Total.....	41,582	41,622	1,197	1,207
Cost of Construction.....	\$3,478,263,650	\$3,508,675,945	\$56,559,713	\$58,836,411
Cost per Mile.....	83,648	84,299	47,200	48,060
PASSENGER TRAFFIC				
Passengers Carried.....	175,054,000	195,017,000	3,489,372	3,341,651
Passengers Carried One Mile....	13,258,401,420	14,369,459,940	145,138,874	142,595,179
Average Journey (miles).....	75.73	73.68	41.69	42.67
Receipts from Same.....	\$79,430,390	\$84,681,703	\$2,119,540	\$2,050,659
Receipts per Passenger Mile (cents).....	0.69	0.63	1.46	1.44
FREIGHT TRAFFIC				
Tons Carried.....	247,664,952	258,339,276	2,037,448	1,560,890
Tons Carried One Mile.....	39,906,552,540	41,605,247,868	167,622,189	133,146,850
Average Haul (miles).....	159.52	159.44	82.27	85.31
Receipts from Same.....	\$334,824,519	\$359,019,243	\$2,958,378	\$2,439,558
Receipts per Ton Mile (cents)....	0.90	0.94	1.76	1.83
Other Receipts.....	.....	.....	\$263,279	\$293,518
Total Receipts.....	\$465,082,015	\$499,101,318	\$5,341,197	\$4,783,735
Expenses of Operation.....	340,314,051	335,360,716	3,363,418	3,726,216
Ratio Expenses to Earnings....	73%	67%	63%	78%
Net Receipts.....	\$124,767,964	\$163,740,602	\$1,977,779	\$1,057,519
Per Cent on Cost of Construc- tion.....	3.59	4.66	3.56	1.80
Gross Receipts per Mile.....	\$11,698	\$12,487	\$4,511	\$3,959
Gross Expenses per Mile.....	8,559	8,390	2,840	3,044
Net Receipts per Mile.....	3,139	4,097	1,671	875
Number of Employees.....	**797,926	**771,938	14,160	14,864
Total Compensation.....	\$162,487,101	\$163,149,009	\$1,120,124	\$1,291,566
Proportion of Gross Earnings..	34.94	32.69	20.97	26.99
Proportion of Operating Ex- penses.....	47.74	48.65	33.30	34.66
Average per Employe per Year.	\$203.64	\$211.35	\$269.23	\$265.54

* Excepting Finland, 2,039 miles; but including Asiatic Russia, 6,149 miles state operated. Traffic returns exclude local lines, 1,445 miles.

† After deduction of tax on passenger, baggage and freight traffic.

** Includes laborers.

‡ Excludes laborers, 3,669 in 1911 and 3,323 in 1912, earning an average of \$225.23 in 1912.

RAILWAYS OF JAPAN.

STATISTICS OF MILEAGE, CAPITALIZATION, TRAFFIC AND EMPLOYES
ON THE IMPERIAL GOVERNMENT RAILWAYS SINCE NATIONALIZA-
TION.

	1907-08	1908-09	1911-12	1912-13
Length of State Railways (miles)*.....	3,982	4,513	4,950	5,217
Cost of Construction.....	\$190,173,728	\$376,943,494	\$436,114,999	\$466,335,640
Cost per Mile.....	47,759	83,524	88,104	89,387
PASSENGER TRAFFIC				
Passengers Carried†.....	101,115,739	123,227,543	151,077,779	160,711,737
Passengers Carried One Mile....	2,353,270,765	2,743,203,558	3,382,586,411	3,626,316,499
Average Journey (miles).....	23.3	22.3	22.4	22.6
Receipts from Passengers.....	\$17,556,883	\$19,543,981	\$23,433,157	\$24,996,797
Receipts per Passenger Mile (cents).....	0.75	0.71	0.69	0.69
FREIGHT TRAFFIC				
Tons Carried.....	18,312,223	23,524,559	29,337,054	32,537,345
Tons Carried One Mile.....	1,441,125,013	1,829,429,158	2,347,871,475	2,691,464,174
Average Haul (miles).....	78.7	77.8	80.0	82.7
Receipts from Freight.....	\$14,590,721	\$17,784,792	\$22,787,091	\$24,602,391
Receipts per Ton Mile (cents)...	0.87	0.83	0.83	0.92
Terminal Charges per Ton (cents).....	11.2	10.9	11.3	‡
Total Rate per Ton Mile (cents).....	1.01	0.97	0.97	0.92
Other Receipts.....	\$2,739,976	\$2,582,018	\$3,869,661	\$4,413,631
Total Receipts.....	\$34,887,580	\$39,910,791	\$50,089,909	\$54,012,819
Expenses of Operation.....	17,875,971	21,429,818	22,884,128	25,006,828
Ratio Expenses to Earnings....	51%	54%	46%	46.3%
Net Receipts.....	\$17,011,609	\$18,480,973	\$27,205,781	\$29,006,991
Per Cent on Cost of Construc- tion.....	8.94	4.90	6.24	6.22
Gross Receipts per Mile.....	\$8,761	\$8,843	\$10,119	\$10,529
Gross Expenses per Mile.....	4,489	4,743	4,023	4,793
Net Receipts per Mile.....	4,272	4,095	5,496	5,733
Number of Employees.....	88,368	89,868	103,418	109,983
Total Compensation.....	\$8,812,806	\$9,238,152	\$11,631,642	\$12,551,960
Proportion of Gross Earnings...	25.26	23.15	23.22	23.24
Proportion of Operating Ex- penses.....	49.30	43.11	50.83	50.20
Average per Employee per Year.	\$99.84	\$102.78	\$112.50	\$114.13

* In addition there were operated in 1912-13, 768 miles of private and light railways against 523 miles the year before.

† Terminal charge absorbed in rate in 1913.

‡ In 1912-13, more than 93% of the passengers were third class and less than 30% first.

NEW SOUTH WALES AND NEW ZEALAND STATE RAILWAYS.

STATISTICS OF MILEAGE, CAPITALIZATION, TRAFFIC AND EMPLOYES
FOR YEARS SPECIFIED.

	New South Wales		New Zealand	
	1912-1913	1913-1914	1911-1912	1912-1913
Length (miles).....	3,930	3,968	12,801	12,840
Cost of Construction.....	\$280,572,110	\$298,359,912	\$148,564,653	\$153,946,641
Cost per Mile.....	71,391	75,202	52,908	53,828
PASSENGER TRAFFIC				
Passengers Carried.....	79,490,012	86,328,421	11,891,134	13,123,879
Passengers Carried One Mile.....	1,192,584,271	1,235,024,536		
Average Journey (miles).....	15.00	14.31		
Receipts from Passengers.....	\$12,513,941	\$13,794,032	\$7,414,322	\$8,167,389
Receipts per Passenger Mile (cents).....	1.05	1.12		
FREIGHT TRAFFIC				
Tons Carried.....	11,666,250	13,245,842	5,887,908	6,246,128
Tons Carried One Mile.....	861,939,969	1,037,910,619		
Average Haul (miles).....	75.60	80.45		
Receipts from Freight.....	\$18,032,207	\$21,418,245	\$10,490,277	\$11,171,391
Receipts per Ton Mile (cents).....	*1.76	*1.74		
Terminal Receipts per Ton (cents).....	23.01	23.44		
Other Receipts.....	\$2,297,786	\$2,492,437		
Total Receipts.....	\$32,843,934	\$37,704,714	\$17,904,599	\$19,338,780
Expenses of Operation.....	22,604,313	26,345,823	12,008,914	13,176,316
Ratio Expenses to Earnings.....	69.82%	69.87%	67.07%	68.13%
Net Receipts.....	\$10,239,621	\$11,358,891	\$5,895,685	\$6,162,464
Per Cent on Cost of Construc- tion.....	3.76	3.87	3.98	4.04
Gross Receipts per Mile.....	\$8,482	\$9,524	\$6,399	\$6,818
Gross Expenses per Mile.....	5,835	6,655	4,390	4,646
Net Receipts per Mile.....	2,647	2,869	2,109	2,172
Number of Employees.....	24,203	27,567	13,523	14,213
Total Compensation.....	\$16,027,840	\$18,732,175		\$8,991,286
Proportion of Gross Earnings.....	48.80	49.68		46.5
Proportion of Operating Ex- penses.....	70.90	71.10		68.2
Average per Employee per Year.....	\$662.22	\$679.51		\$632.61

* Omits terminal receipts.

† Entirely 3½ foot gauge.

SOUTH AUSTRALIA, WESTERN AUSTRALIA AND VICTORIA STATE RAILWAYS.

STATISTICS OF MILEAGE, CAPITALIZATION, TRAFFIC AND EMPLOYEES FOR LATEST FISCAL YEARS.

	South Australia		Western Australia	Victoria
	1912-1913	1913-1914	1913-1914	1912-1913
Length (miles).....	1,534	*1,815	12,966	43,639
Cost of Construction.....	\$70,569,952	\$76,459,667	\$77,305,659	\$231,657,796
Cost per Mile.....	41,760	41,439	26,064	64,519
PASSENGER TRAFFIC				
Passengers Carried.....	19,382,330	19,809,533	19,208,402	111,513,908
Passengers Carried One Mile....	228,706,514	236,764,109	.....	.....
Average Journey.....	11.80	11.95	.....	.....
Receipts from Passengers.....	†\$3,567,918	†\$3,664,641	\$3,246,658	\$12,451,784
Receipts per Passenger Mile (cents).....	1.28	1.26	.....	.....
FREIGHT TRAFFIC				
Tons Carried.....	3,016,039	3,103,471	3,358,630	5,150,404
Tons Carried One Mile.....	335,404,440	402,356,297	.....	.....
Average Haul.....	117.84	129.65	.....	.....
Receipts from Freight.....	\$7,016,806	\$7,471,490	\$7,226,413	\$11,457,347
Receipts per Ton Mile (cents)...	1.94	1.84	.....	.....
Other Receipts.....	\$230,759	\$246,281	\$518,572	\$441,422
Total Receipts.....	\$10,815,484	\$11,382,412	\$10,991,643	\$25,350,503
Expenses of Operation.....	6,782,806	7,333,075	7,655,678	16,932,781
Ratio Expenses to Earnings....	62.71%	64.42%	69.65%	66.79%
Net Receipts.....	\$4,032,678	\$4,049,337	\$3,335,965	\$8,417,722
Per Cent on Cost of Construction.....	5.84	5.33	4.32	3.63
Gross Receipts per Mile.....	\$7,052	\$6,272	\$3,777	\$8,964
Gross Expenses per Mile.....	4,419	4,042	2,631	4,651
Net Receipts per Mile.....	2,633	2,230	1,146	2,313
Number of Employees.....	8,754	8,995	7,992	.....
Total Compensation.....	\$4,441,694	\$4,707,123	\$6,296,326	.....
Proportion of Gross Earnings...	41.07	41.36	57.28	.....
Proportion of Operating Expenses.....	65.48	64.19	82.24	.....
Average per Employee per Year.....	\$507.39	\$523.90	\$787.83	.....

* 1,082 miles 3½ foot gauge, balance 5 foot 3 inches, in 1914.

† Includes mail, parcel checking and sundries.

‡ Entirely 3½ foot gauge.

§ 122 miles 2½ foot gauge, balance 5 foot 3 inches.

XV GROWTH OF RAILWAYS

In three-quarters of a century American railways from small beginnings in Pennsylvania in 1827, Maryland in 1828, South Carolina in 1830, and New York and Massachusetts in 1831, show the following remarkable growth by decades:

PROGRESS OF RAILWAYS IN THE UNITED STATES SINCE 1835.

States	1835	1840	1850	1860	1870	1880	1890	1900	1910±	1913±
Alabama.....	46	46	75	743	1,429	1,851	3,148	4,219	5,022	5,395
Arizona.....						384	1,061	1,511	2,097	2,283
Arkansas.....				38	256	896	2,113	3,341	5,135	5,329
California.....				23	925	2,220	4,148	5,744	7,635	8,183
Colorado.....					157	1,531	4,154	4,587	5,519	5,710
Connecticut...		102	402	601	742	954	1,007	1,023	1,000	1,001
Delaware.....	16	39	39	127	224	280	328	346	335	335
Florida.....			21	402	446	530	2,390	3,272	4,370	4,908
Georgia.....		185	643	1,420	1,845	2,535	4,105	5,639	7,020	7,404
Idaho.....						220	941	1,261	2,168	2,664
Illinois.....			111	2,799	4,823	7,955	9,843	10,997	11,876	12,013
Indiana.....			228	2,163	3,177	5,454	5,891	6,469	7,420	7,461
Iowa.....				655	2,683	5,235	8,347	9,180	9,733	9,917
Kansas.....					1,501	3,439	8,806	8,719	9,007	9,237
Kentucky.....	15	28	78	534	1,017	1,598	2,694	3,059	3,513	3,754
Louisiana.....	40	40	80	335	479	633	1,658	2,824	5,469	5,677
Maine.....		11	245	472	786	1,013	1,313	1,915	2,248	2,271
Mary'd & D.C.	117	213	259	386	671	1,012	1,168	1,407	1,413	1,449
Massachusetts	113	301	1,035	1,264	1,480	1,893	2,094	2,118	2,109	2,130
Michigan.....		50	342	779	1,638	3,931	6,789	8,193	8,985	8,998
Minnesota.....					1,072	3,108	5,466	6,942	8,669	9,026
Mississippi.....			75	802	990	1,183	2,292	2,919	4,413	4,486
Missouri.....				817	2,000	4,011	5,897	6,867	8,078	8,096
Montana.....						48	2,181	3,010	4,207	4,497
Nebraska.....					1,812	2,000	5,274	5,684	6,067	6,142
Nevada.....					598	700	925	909	2,277	2,341
N Hampshire.....		53	467	661	736	1,015	1,133	1,239	1,246	1,256
New Jersey....	99	186	206	560	1,125	1,701	2,034	2,237	2,255	2,310
New Mexico.....						643	1,284	1,752	2,999	3,032
New York.....	104	374	1,361	2,682	3,928	6,019	7,462	8,121	8,416	8,511
N'th Carolina...		53	154	937	1,178	1,499	2,904	3,808	4,734	5,265
North Dakota...					35	635	1,940	2,731	4,201	5,033
Ohio.....		30	575	2,946	3,538	5,912	7,719	8,774	9,128	9,117
Oklahoma.....						275	1,213	2,150	5,978	6,357
Oregon.....					159	582	1,269	1,723	2,279	2,761
Pennsylvania...	318	754	1,240	2,598	4,656	6,243	8,307	10,277	11,084	11,508
Rhode Island...		50		108	136	210	212	212	212	204
So'th Carolina...	137	137	289	973	1,139	1,429	2,096	2,795	3,410	3,618
South Dakota...					30	630	2,485	2,850	3,948	4,206
Tennessee.....				1,283	1,492	1,824	2,710	3,124	3,809	3,990
Texas.....				307	711	3,293	7,911	9,873	14,243	15,608
Utah.....					257	770	1,090	1,547	1,986	2,083
Vermont.....				554	614	912	913	1,012	1,081	1,073
Virginia.....	93	147	384	1,379	1,486	1,826	3,142	3,729	4,443	4,603
Washington.....						274	1,699	2,890	4,858	5,290
West Virginia...					387	694	1,306	2,198	3,526	3,846
Wisconsin.....					1,525	3,130	5,468	6,496	7,328	7,657
Wyoming.....						472	941	1,228	1,600	1,680
Total.....	1,098	2,818	9,021	30,635	52,922	93,671	159,271	192,940	238,609	240,803

±Exclusive of switching and terminal companies—1614 miles in 1912.

GROWTH OF RAILWAYS OF THE WORLD.

In the following table is given the mileage of the principal countries in the world from the earliest date available to the latest:

Country	Miles of Road Completed									
	Opened	1840	1850	1860	1870	1880	1889	1899	1910†	1914*
Great Britain...	1825	1,857	6,621	10,433	15,537	17,933	19,943	21,666	23,280	23,441
United States...	1827	2,818	9,021	30,626	52,922	93,296	160,544		236,422	252,959
Canada.....	1836	15	66	2,065	2,617	7,191	12,585	17,250	24,731	30,795
France.....	1828		1,714	5,700	11,142	16,275	21,899	26,229	29,364	31,145
Germany.....	1835	341	3,637	6,979	11,729	20,693	24,845	31,386	36,235	37,665
Belgium.....	1835	207	554	1,074	1,799	2,399	2,776	2,883	2,983	5,370
Austria (proper)	1837		817	1,813	3,790	7,083	9,345	11,921	13,591	14,185
Russia.....	1838		310	988	7,098	14,026	17,534	26,889	35,347	43,711
Italy.....	1839	13	265	1,117	3,825	5,340	7,830	9,770	10,425	10,800
Holland.....	1839	10	110	208	874	1,143	1,632	1,966	2,235	1,980
Switzerland...	1844		15	653	885	1,596	1,869	2,342	2,791	3,014
Hungary.....	1846		137	1,004	2,157	4,421	6,751	10,619	12,177	13,803
Denmark.....	1847		20	69	470	975	1,217	1,764	2,121	2,333
Spain.....	1848		17	1,190	3,400	4,550	5,951	8,252	8,961	9,517
Chili.....	1851			120	452	1,100	1,801	2,791	3,451	3,950
Brazil.....	1851			134	504	2,174	5,546	9,195	11,863	13,819
Norway.....	1854			42	692	970	970	1,231	1,608	1,913
Sweden.....	1856			375	1,089	3,654	4,899	6,663	8,321	8,574
Argentine Republic.....	1857				637	1,536	4,506	10,013	14,111	20,596
Turkey in Europe.....				41	392	727	1,024	1,900	1,967	1,042
Peru.....				47	247	1,179	993	1,035	1,470	1,661
Portugal.....				42	444	710	1,118	1,475	1,689	1,850
Greece.....	1869				6	7	416	604	843	1,000
Uruguay.....	1869				61	268	399	997	1,371	1,639
Mexico.....	1863				215	655	5,012	8,503	14,845	15,803
Roumania.....					152	859	1,537	1,920	1,976	2,243
Australia†.....						789	4,850	11,111	17,956	21,582
Japan.....	1874					75	542	3,632	5,130	5,291
British India...	1853			838	4,771	9,162	15,887	23,523	30,809	33,404
China.....	1883						124	401	4,997	6,113
Africa.....						583	2,873	5,333	19,207	21,578

†Including New Zealand

*Or latest figures.

‡Including Finland and Asiatic Railways.

XVI

COST OF RAILWAY REGULATION

The cost of regulating American railways continues to increase in a faster ratio than anything else pertaining to them, not even excepting taxes. The record of the growth of this tax on the general revenues is given in the following table of yearly expenditures:

1888	Five Commissioners.....	97,867
1889	" ".....	149,453
1890	" ".....	180,440
1891	" ".....	214,844
1892	" ".....	221,745
1893	" ".....	217,792
1894	" ".....	209,250
1895	" ".....	216,206
1896	" ".....	234,941
1897	" ".....	234,909
1898	" ".....	237,358
1899	" ".....	238,125
1900	" ".....	243,624
1901	" ".....	255,979
1902	" ".....	271,728
1903	" ".....	298,842
1904	" ".....	321,533
1905	" ".....	330,739
1906	" ".....	382,141
1907	Seven Commissioners.....	616,597
1908	" ".....	736,530
1909	" ".....	988,936
1910	" ".....	1,163,336
1911	" ".....	1,290,978
1912	" ".....	1,469,689
1913	" ".....	1,560,404
1914	" ".....	2,094,538
Total 27 years.....		14,478,560
Increase in 26 years.....		1948 per cent

The expenditure of the Commission on account of the physical valuation of the railways during the year 1914 was \$456,565.

TWO DECADES OF RAILWAY PROGRESS

RAILWAY RESULTS IN THE UNITED STATES FOR THE YEARS ENDING
JUNE 30, 1894, 1904 AND 1914 WITH PERCENTAGES OF INCREASE
IN TWENTY AND TEN YEARS.

Item (m = Thousands)	1894	1904	1914	1914 Over 1894 %	1914 Over 1904 %
Population.....	67,632,000	82,466,551	99,027,000	46.4	20.1
Miles of Line (operated).....	175,690	212,243	245,994	40.0	15.9
Miles of All Track.....	229,796	297,073	376,033	63.6	26.6
Net Capitalization (m).....	\$8,646,600	\$10,711,794	\$15,514,465	79.4	44.8
Net Capitalization per Mile of Line.....	50,358	52,099	63,091	25.3	21.1
Net Capitalization per Mile of Track.....	38,063	36,052	41,253	8.4	14.4
Revenues from Operation (m).....	1,073,361	1,975,174	3,041,293	183.4	53.9
Revenues per Mile Operated.....	6,109	9,366	12,368	102.4	32.0
Expenses of Operation (m).....	731,414	1,338,896	2,196,751	200.3	64.1
Expenses per Mile Operated.....	4,163	6,308	8,934	114.6	41.7
Net Revenues from Operation (m).....	341,947	636,277	844,539	147.0	32.7
Net Revenues per Mile Operated.....	1,946	2,998	3,434	76.7	14.6
Ratio of Revenues to Expenses.....	68.14%	67.79%	72.23%	6.0	6.5
Receipts from Passengers (m).....	\$285,349	\$ 444,326	\$ 695,870	143.9	56.6
Receipts from Freight (m).....	699,490	1,379,002	2,102,314	200.7	52.6
Receipts from Mail (m).....	30,059	44,499	54,892	82.7	23.4
Receipts from Express (m).....	23,035	41,875	75,320	227.3	80.0
Passengers Carried (m).....	540,638	715,419	1,032,066	90.9	44.3
Passengers Carried 1 Mile (m).....	14,289,445	21,923,213	35,120,269	145.9	60.2
Average Receipts per Passenger Mile (cents).....	1.983	2.006	1.981 (d)	2.5	0.1
Average Passengers in Train.....	44	46	59	34.1	28.3
Average Journey per Passenger (miles).....	26.54	30.64	34.0	28.1	10.9
Freight Tons Carried (m).....	638,186	1,309,899	1,934,872	203.2	47.7
Freight Tons Carried 1 Mile (m).....	80,335,104	174,522,089	288,746,432	259.4	65.4
Average Receipts per Ton Mile (mills).....	8.60	7.80	7.28 (d)	15.3	6.6
Average Tons in Train.....	179	307	481	168.6	56.6
Average Haul per Ton (miles).....	125	133	149	19.2	12.0
Locomotives (number).....	35,492	46,743	64,430	81.5	37.8
Locomotives Weight without Tender (tons).....	1,632,632	2,853,673	5,413,260	231.6	99.7
Passenger Cars (number).....	33,018	39,752	52,004	57.5	30.9
Freight Cars (number).....	1,205,169	1,692,194	2,304,267	91.2	36.2
Freight Cars Capacity (tons).....	28,924,046	50,759,133	89,784,883	210.4	76.9
Employees (number).....	779,608	1,296,121	1,698,818	117.9	31.1
Employees per 100 Miles of Line.....	444	611	691	56.1	13.1
Compensation of Employees.....	\$438,848,450	\$917,598,810	\$1,373,069,811	212.9	67.9
Proportion of Gross Earnings.....	40.98%	41.40%	45.14%	10.2	9.0
Proportion of Operating Expenses.....	60.00%	61.07%	62.51%	4.2	2.3
Taxes.....	\$38,125,274	\$61,696,354	\$139,969,071	267.1	126.8
Per Mile of Line.....	211	290	569	169.6	96.2
Proportion of Gross Earnings.....	3.58%	3.12%	4.60%	29.7	47.4

(d Decrease)

RECOMMENDATIONS

Renewing former suggestions that the statistics of railways be transferred to a bureau of the Department of Commerce and Labor, and that the investigation of railway accidents should be entrusted to a Board of Inspectors independent of the Interstate Commerce Commission; the writer believes the time is ripe for discussion of a complete reorganization of the Commission itself.

By successive statutes the Commission has been overwhelmed with powers and duties not dreamed of in the original Act to Regulate Commerce. Possessed with authority over the industry most essential to the public weal, it is distracted with details that preclude attention to the broad and difficult problems of railway regulation. It is called on to exercise powers that would baffle the wisdom of the Seven Sages of Greece. Only by a readjustment of the regulating body to the colossal task of controlling the carrier system of a hundred million people can the railway system of the United States be saved from the catastrophe that waits on ineffective regulation.

Today the Federal judicial system affords a working model for a reorganization of the Interstate Commerce Commission. There should be a Central Commission of say Five Commissioners, sitting like the Supreme Court at Washington to hear appeals from Territorial Commissioners, appointed with jurisdiction for the ten railway groups into which the country was formerly divided. Besides its appellate character, the Central Commission should have original jurisdiction over questions involving the railways as a whole—but not involving the taking of testimony. Railway regulation involving interminable investigations should be replaced by brief hearings under strict rules of evidence before the Territorial Commissioners.

The salaries and permanency of office should be such as to command the services of commissioners of high ability and special fitness to the regulation of the most vital industry of the nation. The administration and not the form of the Commission is the crux of railway regulation. There is no magic or inherent virtue in the word Commission.

Respectfully submitted,

SLASON THOMPSON, *Director*,
Bureau of Railway News and Statistics.

Chicago, April, 1915.

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